BY ORDER OF THE COMMANDER
AIR FORCE SPECIAL OPERATIONS COMMAND

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Flying Operations

HELICOPTER OPERATIONS

COMPLIANCE WITH THIS INSTRUCTION IS MANDATORY

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AFSOCI 11-208, 1 March 1997, (and its current associated Changes), is changed as follows:

1. Write-in Changes:

Page	Para	Line	Action
54.1	9.8.2.8.1		Delete.
	9.8.2.9		Delete.
	9.8.2.9.1		Delete.
	9.8.2.9.2		Delete.

2. Page-Insert Changes: Changes are indicated by an asterisk (*).

Remove	Date	Insert
7-8	1 Aug 97	7-8
19-20	1 Aug 97	19-20
51-54	1 Mar 97	51-54
	1 Aug 97	
123-156	1 Mar 97	123-154
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Director, Operations

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FIGURES **Page**

CHAPTER 1

GENERAL INFORMATION

1.1. General.

1.1.1. This is a command directive for helicopter aircrews. It is written for normal and contingency operations to minimize requirements for procedural changes at the onset of contingencies. Procedures for the training environment are included.

1.1.2. The Directorate of Aircrew Standardization/Evaluation (HQ AFSOC/DOV) has overall responsibility for administration of this regulation.

1.2. Applicability. All AFSOC units. References to AFSOC units, personnel, and aircraft in this regulation include all AFSOC-gained forces unless specifically exempted by this instruction.

1.3. Terms Explained:

1.3.1. "Will and shall" indicate a mandatory requirement.

1.3.2. "Should" indicates a recommended procedure that is required if practical.

1.3.3. "May" indicates an acceptable or suggested means of accomplishment.

1.3.4. **WARNING:** Operating procedures, techniques, etc., which will result in personal injury or loss of life if not carefully followed.

1.3.5. **CAUTION:** Operating procedures, techniques, etc., which will result in damage to equipment if not carefully followed.

1.3.6. **NOTE:** Operating procedures, techniques, etc., which are essential to emphasize.

1.4. Deviations and Waivers. Do not deviate from the policies and guidance in this regulation, except:

1.4.1. For safety.

1.4.2. If beyond command and control communications capability, aircraft commanders may deviate from this directive as necessary to protect their crew and aircraft. Although this publication provides guidance for aircraft operations under most circumstances, it is not a substitute for sound judgment. Report deviations, without waiver, through channels to HQ AFSOC/DOV within 48 hours, followed by a written report if requested.

1.4.3. When waived by the appropriate authority. Unless otherwise indicated, AFSOC/DO is the waiver authority for this regulation. AFSOC/DO may delegate this authority to the COMAFSOF for operationally assigned forces. Request waivers through command and control channels.

1.5. Supplements. Groups will publish a supplement to chapter 10, Local Operating Procedures, of this regulation. Units will in turn publish a supplement to the Group's chapter 10. See paragraph 10.1 for items which may be included. Format the chapter to conform to the remainder of this instruction. Unit operating procedures will not duplicate, alter, or amend the provisions of this regulation. No other supplement to this regulation is authorized.

1.6. Requisitioning Procedures. Units will requisition this regulation through their servicing PDO. Volume 2 will be requisitioned separately.

1.7. Revisions. Personnel at all echelons are encouraged to submit proposed changes IAW AFI 11-215, to HQ AFSOC/DOV. Use AF Form 847, Recommendation For Change of Publication.

waived for flight surgeons or medical technicians who are on alert duty for urgent aeromedical evacuation missions.

3.10.1. Crew duty time period starts when the crew reports for flight. Do not construe the initial daily alert activities (e.g., briefing, preflight, cocking, engine run, hover check of the alert aircraft) as starting the flight duty time period of the alert crew.

3.10.2. The alert crew may be considered in crew rest status upon the termination of the flight, even though remaining on alert. It is recognized that numerous circumstances may arise that affect the decision to replace the alert crew, and each incident must be evaluated on an individual basis.

3.10.3. If the alert crew completes 12 consecutive hours of crew rest between flights, the previous CDT period no longer applies and the cycle can be started anew provided the crew does not remain on alert for more than 72 hours from their initial assumption of alert.

3.10.4. Do not use the alert crew as a "preflight or engine run" crew for aircraft, other than the alert aircraft, nor to perform other fatiguing duties.

3.10.5. Grant alert crews required to stand alert at locations other than their domicile during other than normal duty hours 1 hour of free time for every 3 hours of alert.

3.11. AFSOC Alert Aircraft. Unit CC/COMAFSOF will determine if aircraft are on alert. AFSOC "Alert" aircraft designations are not directed by the National Command Authority (NCA), but are implemented by the mission commander to place designated aircraft packages on an increased level of standby and does not require increased security forces as indicated in AFI 31-101, Chapter 13. The decision to post additional security forces should be based on the local threat. Maintain aircraft on alert status IAW the following:

3.11.1. Parking. Park the alert aircraft in a designated alert parking area to expedite taxi and takeoff.

3.11.2. Fuel Load. Unit Commanders will determine the fuel load of alert aircraft based on the type of operation, mission activity, and requirements within their area of operation.

3.11.3. Climatic Protective Facilities. During periods of extreme cold or severe weather, every effort should be made to shelter essential AGE and alert aircraft in a hangar to ensure operational readiness in the event of a mission. Blade covers and engine heaters must be available for use, as required.

3.11.4. Flying Alert Aircraft. The alert aircraft may be flown for purposes other than actual alert missions provided the following conditions are complied with:

3.11.4.1. Alert requirements can be met with sufficient fuel to meet mission requirements.

3.11.4.2. Communication contact is maintained with the primary controlling agencies.

3.11.4.3. Complete operationally qualified crew is on board.

3.11.4.4. Controlling agencies are notified any time the alert aircraft departs the local area.

3.12. Alert Procedures. Give alert crews a general briefing at the beginning of each alert period. Update the briefing every 24 hours to include weather, local NOTAMs, latest FCIF information, special instructions, and any other appropriate items. Alert crews will prepare a DD Form 365F, Weight and Balance, for the alert aircraft and are authorized to prepare a TOLD card using the worst weather conditions expected during the alert period. Use this TOLD data only for alert scrambles. If the alert aircraft is flown for other reasons, accomplish a TOLD card for that flight using existing weather conditions.

3.12.1. When an alert crew change occurs and the same aircraft remains on alert, the oncoming alert crew will complete an aircraft preflight, and as a minimum, apply power to the aircraft and check applicable items listed below. When an alert aircraft changes the alert crew will perform an aircraft preflight, engine run, hover check, and cocking of the aircraft.

3.12.1.1. Review AFTO Form 781.

3.12.1.2. Proper Configuration and Special Equipment.

3.12.1.3. Fuel quantity.

3.12.1.4. Survival and Emergency Equipment.

3.12.1.5. Navigation and Communication Equipment.

NOTE: Should the aircraft remain on alert for more than 3 consecutive days, a complete aircrew preflight is required each fourth day, to include an engine run and rotors engaged, and refuel probe inspection.

3.12.2. Once accepted for alert, the alert crew will make an entry in the AFTO Form 781, stating, "Aircraft accepted on alert at _____, _____." (local time and date). No maintenance may be performed on it without prior approval of the alert crew aircraft commander and notification of the unit operations section. To ensure integrity of the crew preflight, an alert crewmember must be present whenever maintenance is performed, or at the completion of the maintenance, the crew is required to check the area in which maintenance was performed. The check should be performed as soon as practical after the maintenance and must be performed prior to flight.

3.12.3. Waiver authority for alert procedures is Wing/Group CC or COMAFSOF, as appropriate.

3.13. Reconstitution of Alert. Whenever a unit's alert forces have been or are being utilized, that unit should make every effort to reconstitute its alert capability in order to react to additional missions or assist present operations if the situation dictates. If this is not feasible, then efforts should be initiated with other agencies to provide assistance in covering the alert.

*** Figure 3.1. Crew Complement.**

	MH-53	MH-60	UH-1N
Mission	P CP FE AG	P CP FE AG	P CP FE Scan
FCF (Note A)	1 1 1	1 1 1	1 1[D]
Transition/Instm/EP's/Remote *(NOTE I)	1 1 1	1 1 1	1 1
SAR/ALERT	1 1 2 2	1 1 1 1	1 1 1[EF]
Day/Night Tac	1 1 2 2	1 1 1 1	1 1 1[EFG]
Ferry (Note C)	1 1 1	1 1 1	1 1[H]
Non-Tac Day Formation	1 1 1	1 1 1	1 1
*Day Water Ops	1 1 2 2	1 1 1 1	1 1 1[EF]
Augmented	Note B	Note B	N/A

NOTE A. Unit commanders must designate FCF crewmembers in writing. When designated crewmembers are not available, other highly qualified crewmembers may be designated by the commander or his designated representative on the AFSOC Form 41. FCF copilots should be aircraft commander qualified. This, however, does not preclude designation of a highly qualified copilot when an aircraft commander is not available.

NOTE B. Requires one more aircraft commander and flight engineer.

NOTE C. Non-simultaneous air refueling may be accomplished.

NOTE D. FCF qualified copilot, flight engineer, or crew chief.

NOTE E. Any qualified scanner.

NOTE F. Hoist operations will be performed by a qualified hoist operator.

NOTE G. Night tac operations into landing zones equal to or larger in size than 3 rotor disks require 1 scanner. Night tac operations into landing zones less than 3 rotor disks in size require 2 scanners.

NOTE H. A flight engineer or crew chief will accompany aircraft recovering away from home station.

***NOTE I.** Exception: Night EPs require a Night Tac crew.

CHAPTER 9

TRAINING

***9.1. General**. This chapter outlines procedures, requirements, and restrictions for qualification and continuation training or evaluation flights. See AFIs 11-202 Volumes 1-3, as supplemented, for additional information.

9.2. Training Aircraft Not Capable of Flight. If an aircraft is not capable of departure within 4 hours after scheduled departure time, cancel the training mission unless waived by the aircraft commander. Departure consists of actual takeoffs for assigned or planned training missions, and does not include maintenance ops checks or aborted hover checks. Do not charge the delayed departure as a crew delay.

9.3. Live-Hoist Training (Nonexercise). Restrict live-hoist training to the minimum necessary to accomplish initial qualification, requalification, and proficiency training. For other than primary aircrew members, unit commanders determine eligibility of personnel to ride the hoist during training. Altitude is the minimum required to accomplish the mission. When over water or over vessels, hover at the minimum altitude necessary to avoid salt spray. Practicing hoist with or without a tag line is permissible.

9.4. Terminal Operations Training.

9.4.1. Site Selection.

9.4.1.1. Landing areas - two rotor diameter minimum.

9.4.2. Landing Zone Surveys.

9.4.2.1. When an LZ survey is conducted, the following items should be included in a survey briefing or diagram:

9.4.2.1.1. LZ suitability: size, shape, slope, surface, condition.

9.4.2.1.2. Site elevation.

9.4.2.1.3. Obstructions.

9.4.2.1.4. Orientation of the long axis.

9.4.2.1.5. Recommended approach and departure headings.

9.4.2.1.6. Prominent land marks.

*9.4.2.2. Local training areas require LZ surveys. Make site diagrams of the LZ survey available to each crew utilizing the LZ. Surveys must be updated every 6 months by a qualified crew or CCT LZ survey.

9.4.2.3. For exercise participation, LZ surveys should be accomplished. Unit commanders or COMAFSOF may authorize one of the following methods, in order of priority, if an aircrew LZ survey is not possible:

9.4.2.3.1. CCT or ground party LZ survey.

9.4.2.3.2. Satellite photography LZ survey.

9.4.2.3.3. Thorough map study (1:50,000 scale map or less) LZ survey.

9.4.3. Simulated Maximum Power Remote Operations Maneuver.

9.4.3.1. Accomplish high and low reconnaissance and compute the power required to accomplish the maneuver. Use the computed power as the simulated maximum power available; however, do not hesitate to use all available power in the interest of safety.

9.4.3.2. Initiate the approach after careful consideration of all factors influencing the crew and aircraft performance. Try to fly the approach using no more than the power computed for the hover or landing. Vary closure rate, and vertical velocity to fly the desired approach angle and arrive at the specific landing or hover spot. As the aircraft decelerates, be cognizant of the influence that wind, ground effect, and translational lift have upon your ability to control vertical velocity.

9.4.3.3. Accomplish the takeoff using simulated maximum power.

9.5. Simulated Instrument Flight. The use of a hood or other artificial vision-restricting device is not authorized for any phase of flight. Simulated instrument flight may be flown and logged without use of a vision-restricting device.

9.6. General. Maneuver standards are provided to supplement the flight manuals. Conduct operational or special mission maneuvers not addressed in this section IAW the appropriate directive/technical order that defines such maneuvers.

9.7. Emergency Procedures (EP) Training. EP training is designed to develop aircrew proficiency, reaction time, planning, and judgment in preparation for actual emergencies. Simulated emergencies must provide realistic training without unacceptably increasing risk. Instructors should be alert and take prompt action to terminate simulated emergency maneuvers and execute a go-around at the first indication of deteriorating aircraft performance or serious student proficiency problems. Place emphasis on the procedures for positive identification of the simulated emergency condition before initiating corrective action. System failures must not be unreasonably compounded and must not be simulated in conjunction with a simulated engine failure unless normally associated with that engine failure. The surprise approach of initiating emergency procedures, aircraft system failures, or unusual attitude training must be tempered to allow for a possible wrong reaction or mistake which could jeopardize safety; therefore, practice such emergencies with sufficient airspeed and altitude to ensure a safe recovery. Emergencies which could require an in-depth analysis and discussion or detailed cockpit duties should only be simulated when traffic congestion is at a minimum. Accomplish all simulated emergency maneuvers IAW the flight manual and this section.

9.8. Simulated Emergency Restrictions and Procedures.

9.8.1. Prohibited Maneuvers. The following maneuvers are prohibited in the aircraft:

9.8.1.1. Actual engine shutdown.

9.8.1.2. Blade stall and power settling.

9.8.1.3. Dual fuel control failures.

9.8.1.4. Dual hydraulic system failures.

9.8.1.5. Water landings.

9.8.1.6. Hovering autorotations (UH-1N).

*9.8.1.7 Practice autorotations after official sunset.

*9.8.2. Restrictions. Accomplish unusual attitude training and autorotations during day VMC (prior to official sunset) only. All other EPs may be conducted during day or night VMC conditions. The following restrictions apply to all EP training:

*9.8.2.1. Simulated emergency procedures will be accomplished at a military airfield or designated airfields with letters of agreement and proper crash and rescue equipment.

9.8.2.2. During training, currency, or evaluation flights.

9.8.2.3. When passengers are not aboard.

9.8.2.4. When an instructor or flight examiner pilot is designated on flight orders under "Crew Position" as IP or EP and occupies a pilot seat with a set of controls. Instructor pilot candidates may perform or supervise simulated emergencies during initial evaluations under the supervision of a flight examiner pilot not in a pilot seat if the other pilot at the controls is qualified as an aircraft commander, or higher, in the maneuver.

9.8.2.5. In addition to the above restrictions, the following restrictions apply to night EPs:

9.8.2.5.1. Instructor pilot is "certified" for night EP's.

*9.8.2.5.2. Crew compliment is Night TAC (IAW Fig 3-1.).

9.8.2.5.3. Weather is at or above 1,000 feet ceiling and 2 statute miles visibility or circling minimums, whichever is higher.

9.8.3. Practice Autorotations. The following policy is established for practice autorotations:

9.8.3.1. Due to the risk associated with this maneuver, carefully consider wind, density altitude, aircraft gross weight, and individual pilot proficiency prior to training. Fly each approach as if a landing may be required. If a malfunction occurs, the aircraft is then in position to execute a safe landing.

9.8.3.2. The initial autorotation for training or currency must be a straight-ahead autorotation accomplished by the instructor to evaluate aircraft performance (during evaluations, the pilot being evaluated may perform this autorotation). The first autorotation will be accomplished from 1000 feet AGL(MH-53) or 500 feet AGL(MH-60).

9.8.3.3. Instructor pilots will terminate the maneuver and initiate a power recovery at the first indication of abnormally high or low rotor RPM, excessive sink rate, low airspeed, ineffective flare, or at any time an inadvertent touchdown might occur.

9.8.3.4. Accomplish autorotations to a runway or taxiway if possible. When such an area is not available, select a smooth, level area. The instructor or flight examiner will ensure it is free of obstructions prior to commencing training.

9.8.3.5. Power recovery autorotations require the aircraft to be aligned within 45 degrees of the wind direction when winds are 15 knots or greater; below 15 knots aircraft heading must be within 90 degrees of the wind. A functional wind indicating device must be available to provide accurate wind information.

9.8.3.5.1. H-1 power recovery autorotations require the aircraft to be aligned within 45 degrees of the wind direction when winds are 10 knots or greater; below 10 knots, aircraft heading must be within 90 degrees of the wind.

9.8.3.6. Autorotation Procedures.

9.8.3.6.1. H-60 minimum entry altitude for 180-degree autorotations is 800 feet AGL; 500 feet AGL for 90 degree autorotations and 200 feet AGL for 45 degrees or less autorotations. The throttles must not be retarded. Initiate the flare between 125 and 75 feet AGL with a minimum of 80 KIAS. Complete the power recovery no lower than 15 feet.

9.8.3.6.2. H-53 minimum entry altitude for autorotations is 500 feet AGL with no more than a 45 degree offset from the intended landing direction. Autorotations requiring more than 45 degrees of turn will be accomplished from a minimum of 1,000 feet AGL. The throttles will not be retarded.

9.8.3.6.3. H-1 minimum entry altitude for 180-degree turning autorotations is 800 feet AGL; 500 feet AGL for autorotations less than 180-degrees. For 180-degree autorotations, the aircraft must be wings level, have a minimum of 60 KIAS, rotor RPM within limits, normal rate of descent, and be aligned with landing/recovery heading at no

lower than 150 feet AGL. If any of these conditions are not met, initiate a power recovery immediately. The wings level requirement does not prohibit minor heading corrections on final. When practicing autorotations in excess of 180 degrees initiate a power recovery at or above 500 feet AGL. All practice autorotations will terminate with a power recovery no lower than 4 feet AGL with a maximum ground speed of 15 knots. The throttles will be retarded until power recovery is initiated.

9.8.4. Simulated Single-Engine Emergencies.

9.8.4.1. Single-engine approaches and landings where a throttle is retarded, must be practiced to a hard surface landing area.

9.8.4.2. Initiation of practice single-engine emergencies must not be lower than 300 feet AGL, 80 KIAS.

NOTE: Practice single-engine emergencies may be initiated below the above listed altitude as long as torque available is limited on both engines versus reducing torque available on the simulated failed engine. Instructors must use caution when simulating single-engine emergencies at low altitudes and airspeeds.

9.8.4.2.1. H-1 Only. If single engine hover power is available, the maneuver may be initiated in a hover. Do not reduce torque on the simulated failed engine unless indicated torque is below computed single-engine torque available. Accomplish a power available check prior to beginning the approach. Terminate training if the engine produces less than computed power minus 2%. For subsequent approaches using the same engine, the power available check may be simulated.

9.8.4.3. Practice the following simulated single-engine maneuvers by limiting the torque available on both engines versus reducing torque for the simulated failed engine:

9.8.4.3.1. Air refueling.

9.8.4.3.2. Approaches to a spot.

9.8.5. AFCS/Boost--OFF. Conduct under the following limitations:

9.8.5.1. Initiate maneuvers on the ground or in straight and level flight at a minimum altitude of 300 feet AGL and 80 KIAS.

9.8.5.2. Make approaches to a hover or landing to a hard surface landing area or slide area.

9.8.5.3. If any control difficulties are encountered while the system is off, the instructor or flight examiner will take control of the aircraft and restore the system as appropriate.

9.8.6. Manual Fuel Operations (H-1). Conduct under the following limitations:

9.8. 6.1. Entry will be at a minimum of 500 ft AGL and 70 KIAS, in a hover when single-engine hover capability is available, or while on the ground. Ensure collective setting is below computed single-engine torque available prior to retarding the throttle to flight idle. Complete flight manual procedures, maintaining torque approximately five to ten percent below the governed engine. To return to automatic fuel control, use the checklist and return the fuel control switch to its original position.

9.8.7. Slide Landing Training Areas (H-1). Local slide landing training areas are used for emergency and normal procedure maneuvers. If wind information at the slide area cannot be obtained through tower services, an operational wind detection device must be readily discernible to the pilots flying and close enough to provide accurate information.

9.8.7.1. Operations group will determine requirements/dimensions for helicopter slide landing areas.

9.7.2. The pilot in command will accomplish the following: 1) Brief the hazards of the slide landing area prior to commencing any maneuvers, 2) visually inspect the slide area for hazards and surface condition, and 3) if the slide area is not safe, go to a hard surface area if available.

CHAPTER 18

ALTERNATE INSERTION and EXTRACTION PROCEDURES

***18.1. General.** The following methods provide an effective alternate means of inserting or extracting personnel during operations when landing is not feasible. Procedures apply to both day and night operations. Crewmembers may utilize ANVIS, ITT F4949 goggles, PAVE LOW unique systems and/or AHHS systems for NVG/night water operations. When conducting night water operations, a safety boat, second hoist-equipped helicopter with a qualified crew or a second helicopter capable of deploying a raft will be present. When deploying personnel during day or night water operations, a safety boat or second hoist equipped helicopter with a qualified crew, will be present. When mission requirements dictate, the COMAFSOF/MC may waive the covership/safety boat requirements. MH-53 flight engineers in the seat do not need to be night water ops qualified.

***NOTE:** The following are Army and Navy limitations for deployments of personnel and boats. These limitations are for informational purposes only and are not restrictive:

1. Wind - 15 knots over open water.
2. Sea state - 3 (3 foot chop/4 foot swell).

***18.2. Mission Briefing.** Prior to deployment or pickup, the aircraft commander will ensure all briefings are accomplished. The premission (team) brief should cover type of deployments, procedures, lost comm, hand/light signals, safety considerations and time warnings to be given to the team. Standard calls are 20 minutes, 10 minutes, 5 minutes, and 1 minute out, but can be revised to meet customer needs.

18.2.1. Commanders will comply with the following minimum safety standards:

18.2.1.1. Designate a Fast Rope Master (FRM) for fast rope operations and a Rappel Master (RM) for rappelling operations.

18.2.1.2. The pilot in command (or his designated representative) and the FRM/RM must have a team briefing prior to all infil/exfil operations.

WARNING (MH-53): Prior to conducting deployments off the ramp, team members must be briefed on the importance of maintaining separation between members prior to exiting the aircraft. Approximately 24 to 27 inches are desired. This separation will help maintain aircraft in CG limits. Scanners should keep team members from bunching up at the rear of the helicopter during the flare (prior to hover) to prevent a rapid shift in the CG.

18.3. Not used.

18.4. Low and Slow. This maneuver provides an effective method of delivering swimmers or boats near a target or objective area in the water (figures 18.1 and 18.2).

NOTE: This maneuver applies to operations below 50 feet AWL.

18.4.1. Operating Procedures.

18.4.1.1. Determine the wind direction prior to personnel/boat delivery. Some objectives can drift up to 10 percent of the wind velocity. Usually, personnel deliveries should be made down drift of the objective. When mission circumstances warrant, deliver swimmers upwind or offwind.

18.4.1.2. Maneuver the aircraft on an extended final, downwind of the selected deployment location. Determination of whether to perform a normal or coupled/AHHS approach is at the discretion of the Aircraft Commander.

18.4.1.3. Make final approach at a maximum of 10 feet AWL and 10 knots GS.

18.4.2. Safety Procedures.

18.4.2.1. Position the safetyman in the H-53 and the H-60 so as to allow visual monitoring of the AIE device and remain clear of the team while they are departing the aircraft. The team chief should be in a position to view the objective area at approximately 50 feet AWL.

18.4.2.2. Open all deploying exits at 50 feet AWL and below. Deploying personnel must be in a restraining harness or safety belt until the five minute call.

18.4.2.3. The "thumbs up" from the safetyman to the deploying team on final indicates 10 feet AWL and 10 knots GS is confirmed, and the team is cleared to deploy at the team leader's discretion.

WARNING: The safetyman will ensure the departing team members have removed their restraining devices prior to deploying.

18.4.2.4. All required water hoist extraction devices should be on board, inspected, and rigged prior to low and slow deployments.

18.4.2.5. All rescue hoist checklists should be completed in the event an injury occurs to the departing team. An immediate extraction may be required. Stow the rescue hoist hook so the cable is not in the doorway.

18.4.2.6. The team leader will brief equipment delivery procedures (i.e., the safetyman or another team member may be required to deploy the stokes litter).

18.4.2.7. The safetyman will ensure adequate gear and airframe clearance exists during deployments.

18.4.2.8. Deploying team members should show a "thumbs up" (chemlight at night) signal after water entry. This indicates they are "OK" and have not sustained injuries.

*18.4.2.9. If a pattern is planned, aircrews should use the typical water operations/hoist pattern depicted in figure 18.1. Regardless of the type pattern flown, do not accomplish turns below 50 feet AWL with the exception of minor heading changes on final. If OGE power is not available, maintain a minimum of 50 KIAS during the water recovery pattern.

18.4.3. NVG Low and Slow (N/A for PAVE LOW/AHHS systems).

18.4.3.1. Equipment. The following equipment is recommended for NVG water operations:

18.4.3.1.1. Infrared (IR) lightsticks.

18.4.3.1.2. High-intensity (HI) red lightsticks.

18.4.3.1.3. 12-hour red lightsticks.

18.4.3.2. Chemlight Preparation.

18.4.3.2.1. The chemlight "star" is a group of five 30-minute high-intensity red or IR chemlights tied together through the eyelets to provide a "spread" pattern. The “star” is used to simulate a survivor during training.

18.4.3.2.2. The Composite pattern consists of 24 red/IR chemlights (12 each for the FE and Gunner).

18.4.3.3. Procedures.

18.4.3.3.1. Once in the desired area for insertion, deploy a chemlight “star” to simulate the survivor (if desired). Deploy the composite pattern and then fly the water operations pattern as shown in figure 18.1.

*18.4.3.3.2. Deploy a composite pattern. Maintain approximately 100 feet AWL and 50 knots GS through the insertion zone. Starting at the beginning of the insertion zone the pilot not flying will make six "throw" calls a minimum of 2 seconds apart. Using the “throw” calls as their cue, the left and right scanners will each throw three groups of three red/IR chemlights followed by three single red/IR chemlights. At the end of the insertion zone make a turn to downwind to enter the water operations pattern depicted in Figures 18.1 and 18.2. The timing, spacing, and number of chemlights may be adjusted as necessary.

18.4.3.3.3. Once on final, descend and decelerate to a maximum of 10 feet AWL and 10 knots GS prior to reaching the chemlight pattern. When stabilized in the above parameters, the pilot not flying calls “in parameters”, the pilot flying then gives the “swimmers, swimmers, swimmers” or “boats, boats, boats” call. Personnel will deploy after the call is relayed to the team leader. After all personnel deploy and give a thumbs-up (chemlight at night), execute climb out to cruise/pattern altitude.

***18.5 Hoist.** The following procedures apply to both day and night operations. Hoist operations at night can be accomplished using NVGs and/or PAVE LOW/AHHS systems. During exercise training, comply with exercise procedures in Chapter 9.

***WARNING:** Ensure that cable slack is held to the minimum necessary to perform the recovery to lessen the chance of fouling the cable. Excessive slack in the cable can be especially dangerous during night and/or water recovery when the survivor cannot see the cable. Carefully monitor the cable and the rate of speed when taking up slack to reduce the chance of entanglement with personnel on the rescue device. Notify the aircraft commander any time the hoist cable cannot be adequately monitored. In such cases, alternate methods of making the pickup should be considered or an additional crewmember should be used to help monitor the hoist cable.

***WARNING:** Excessive hoist cable slack can be extremely dangerous. If excessive cable slack becomes unmanageable, the survivor/rescuer should abandon the rescue device, move to a safe distance, and signal to have the excessive cable slack removed before reattempting the extraction.

***WARNING:** Use extreme care when hoisting the rescue device because of pendulum action and rotation. It is imperative that pendulum action or rotation be recognized and corrected immediately. Delay in doing so may produce rotations of unmanageable proportion. The oscillations may reach a magnitude sufficient to cause hoist cable to aircraft contact. The pendulum action may be dampened by moving the cable in the opposite direction of the movement of the rescue device. Rotation of the rescue device can be stopped, if detected early, by rotating the hoist cable in a 1- or 2-foot circle in the opposite direction of the rescue device. All techniques that require the application of force on the hoist cable become much more difficult to accomplish as hoist weights increase above 300 pounds. Raising an oscillating load will only increase the oscillation. An oscillating load should be stopped where it is until the oscillation is stopped. Avoid trying to raise the load too quickly when oscillations are present. If the oscillation is severe, the load should be lowered to decrease the severity. In extreme emergencies if rotation and oscillation cannot be stopped, the pilot can transition to forward flight at an airspeed up to -1 limitations to stop rotation and oscillation. Tag line procedures should be considered as a way to control and prevent pendulum and oscillations of the rescue device.

CAUTION: A survivor unfamiliar with rescue hoist procedures should be assisted by a crewmember.

NOTE: Rescue devices used for hoist training must be identical to and configured the same as operational equipment. If live-hoist training is to be conducted, use only operational equipment. Rescue devices used at night may be marked by chemlights.

18.5.1. Hoist Operations. The primary hoist operator must be the FE; however, any crewmember may be designated the hoist operator as the mission dictates. Therefore, all crewmembers should understand these duties. The hoist operator's duties are to relay directional instructions on interphone and to operate the hoist from the cabin position. When radio contact is not available, use hand signals between ground personnel and the helicopter.

18.5.1.1. Ground the hoist to discharge static electricity to prevent personnel on the ground or water from sustaining a shock. To preclude ignition, do not ground the hoist near spilled fuel or oil.

18.5.1.2. Greater than normal oscillations may occur when the hoist cable is raised and lowered without some weight attached.

18.5.1.3. Do not conduct hoist training with the hoist operator's interphone inoperative.

18.5.1.4. The hoist operator will wear a heavy, work-type glove or equivalent, on the hand used to guide the hoist cable and have the helmet visor down or eye protection in place.

18.5.1.5. Complete the hoist operator's checklist prior to final approach.

18.5.1.6. Pilots must devote full attention to altitude control and power settings during the transition from the approach to the hover phase. The hoist operator should shift visual references from the water to the horizon at frequent intervals to prevent spatial disorientation.

18.5.1.7. A raft approached very slowly will be blown along slowly in advance of the rotor wash. As a raft is approached, do not excessively slow the closing speed, but move smoothly toward and directly over the raft. Hovering over small boats may present the same drift difficulties as a raft. Personnel supported by life jackets present no drift problem.

18.5.1.8. If the survivor appears to be injured and is attached to the parachute, hover at an adequate distance to prevent the rotor wash from billowing the parachute and dragging the injured survivor.

18.5.1.9. When the survivor is in the rescue device and ready for hoisting, the hoist operator will give instructions to position the helicopter over the survivor and take up any slack in the cable. Normally, the hoist operator will raise the survivor; but may request the pilot to "raise helicopter." The hoist operator will keep the pilot advised of the survivor's position. When the survivor is in the cabin, notify the pilot and complete the after pickup checklist. When over trees, advise the pilot when the survivor is clear of the trees.

18.5.2. Terminology.

18.5.2.1 The hoist operator directs the pilot over the survivor or hover point using standard terminology. Instructions should be clear and concise with commentary on the progress of the approach and hover operation. The hoist operator can aid the pilot with airspeed control during the approach by describing the reduction of distance, in a numerical sequence, on final to the intended hover point. The frequency of numerical calls that are made should indicate the speed of the helicopter toward the survivor or closure rate. A closure rate is not necessarily given in a preset distance of feet, yards, or meters. An example would be "survivor at twelve for one hundred, seventy-five, fifty, forty, etc." The faster the call, the more rapid the closure. Five, four, three, two, one, stop." If too fast and you cannot safely slow the helicopter down in time, do not hesitate to call a "go around." Standardized words for directions and motion may be added to better describe actions necessary for safe operation; i.e., "Slow forward, turn right, stop back." For example:

DIRECTION	**MOTION**
Forward	**Fast**
Back	**Slow**
Right	**Stop**
Left	**Hold**
Up	**Turn**
Down	**Raise helicopter (for initial lifting of survivor)**

18.5.3. Safety Procedures.

WARNING: Smooth water adversely effects depth perception.

18.5.3.1. Spatial disorientation can become a problem during periods of reduced visibility. Use the attitude indicator as an additional reference in conjunction with the sea dye, smoke markers, or chemlight pattern or use PAVE LOW/AHHS systems.

18.5.3.2. Beware of the tendency to drift backwards while hovering at night over water. This may result in a loss of relative wind and loss of lift causing the helicopter to descend. If allowed to continue, sufficient power may not be available or overtorque of the main gear box may be required to recover.

18.5.3.3. During night water recoveries, inadvertent descents are insidious and require constant vigilance. One method to guard against inadvertent water contact is to set the pilot’s radar altimeter slightly lower than the intended hover height as a warning to take immediate corrective action.

18.5.4. Forest Penetrator.

18.5.4.1. The description and maintenance instructions for the forest penetrator are contained in TO 14S6-3-1 and TO 00-25-245, Section IV.

18.5.4.2. The forest penetrator can be used for single or multiple recoveries from land or water. The forest penetrator can be used to recover inert or injured personnel safely with the exception of those with back injuries.

18.5.4.3. Procedures.

18.5.4.3.1. Fold the seat paddles and stow safety straps with the zippers closed before lowering the forest penetrator through trees or dense foliage.

18.5.4.3.2. If the hoist operator loses sight of the penetrator, the cable tension must be relied upon to detect when it has reached the ground. If it appears that the penetrator has reached the ground, it should be raised several feet and relowered to ensure that it is not hung up.

18.5.4.3.3. When there is no visual or oral communication with the ground party, the ground personnel will jerk on the cable as the signal to start retrieving the cable. Hoist retrievals from trees must be slow enough to allow fending off branches and to prevent cable entanglement.

18.5.4.3.4. It is possible to recover three people at one time with the penetrator. However, this should only be done when time is critical since it may load the hoist to the limit.

18.5.4.3.5. If the crewmember leaves the penetrator to assist the survivor, fold the seat paddles and stow the safety straps with zippers closed so that they will not snag on obstructions if the helicopter moves or the hoist cable has to be retracted.

18.5.4.3.6. For water recoveries, install the flotation collar prior to lowering the penetrator. Place one seat paddle in the down position and remove one safety strap from the stowed position. Do not unhook the safety strap fastener from the penetrator.

18.5.4.3.7. NVG forest penetrator preparation. The forest penetrator is prepared by taping one lightstick to the bottom of each of the three paddles. Two 7.5 inch flexible bands may be looped thought the suspension ring down and around the black rubber bumper.

18.5.5. Stokes Litter.

18.5.5.1. The description and maintenance instructions for the stokes litter are contained in TO 00-75-5. This device holds a survivor immobile in a horizontal position. The sides of the litter protect the survivor from bumping against obstructions or the side of the helicopter during retrieval. Configure the stokes litter with the sling, flotation devices, and three restraining belts when stowed on the aircraft.

18.5.5.2. Procedures.

18.5.5.2.1. To lower the litter, place it outside the aircraft foot end first, then move it parallel to the side of the helicopter. The hoist operator may be required to lean out of the door to maneuver the litter.

NOTE: For water recoveries, the stokes litter may be deployed utilizing the low and slow deployment procedures. This is the quickest means of deployment and subjects a critically injured survivor in the water to less exposure to rotor wash.

18.5.5.2.2. Lower the stokes litter to the survivor after the helicopter is established in a hover. The hoist operator provides enough slack so that the crewmember can disconnect the hoist cable. It is not necessary to stay over the survivor once the litter is removed. After the survivor is secured in the litter and ready for hoisting, the crewmember reconnects the hoist cable and ensures that the rescue hook safety pin and carabiner locking sleeves are properly positioned. When using the stokes litter, ensure that the survivor is securely strapped in the litter prior to hoisting. For small patients, the belt can be routed directly across the patient. For large patients, the belt can be routed outside and over the top bar before securing the patient to the litter.

18.5.5.2.3. Stop the litter just below the helicopter. Then maneuver the litter to align it parallel to the aircraft. At the same time, push the litter outward so that the basket does not contact the side of the helicopter. Litter maneuvers may require both hands. This maneuvering may be accomplished by using the litter cables.

18.5.5.2.4. When the stokes litter is parallel, raise the litter to the full-up position so that the litter is above the cabin floor level. Turn the litter perpendicular to the aircraft and pull it into the cabin head first. The pilot or another crewmember may have to provide cable slack at this point.

18.5.5.2.5. NVG stokes litter preparation. Attach one chemlight at the foot and two chemlights at the head of the stokes litter. If a tag line is used, attach one chemlight to the tagline bag.

18.5.6. Tag Line. The tag line aids the pilot by reducing the time required to hover without a reference and prevents pendulum or spinning motion during hoisting. It should be used to guide the recovery device to or from confined areas, such as ship rigging, trees, etc. It may also be used to pass messages or transfer small items to or from the helicopter. In this case attach the weak link to a cabin tiedown ring. Procedures for a tag line hoist are as follows:

*18.5.6.1. A weight should be attached to the end of the tag line without the weak link. The other end of the tag line may be fastened to either the hoist hook or the recovery device. Snap the tag line to the hoist hook or the hoisting device by the weak link.

18.5.6.2. Deliver the tag line from a hover while using extreme care to avoid fouling the line in the rotor system.

18.5.6.3. To deliver the tag line to a small vessel, establish a hover short of the vessel and lower the tag line to the water, and then raise it approximately 5 feet AWL. The hoist operator will then direct the pilot to the vessel.

18.5.6.4. To deliver the tag line to a large vessel with a restricted pickup area, the tag line should be lowered after the helicopter is in a hover over the vessel.

18.5.6.5. Once the tag line is on the vessel and the boat crew is tending it, the hoist operator directs the pilot clear of the vessel while paying out slack in the tag line until the pilot can again see the vessel.

NOTE: Do not allow the tag line to be attached to the vessel.

18.5.6.6. Shipboard personnel use the tag line to guide the recovery device into the desired location.

18.5.6.7. When the recovery device is on the vessel's deck and the survivor is ready for hoisting, the hoist operator gives directions to position the helicopter back over the deck. Retrieving the rescue device vertically may not always be possible. As soon as the survivor is clear of the deck and all obstructions, the hoist operator clears the helicopter away from the vessel, usually left but sometimes back. Maintain this position until the survivor is in the cabin and the tag line is either retrieved or discarded.

*18.5.7. Horse Collar (Rescue Strop).

*18.5.7.1 The description and maintenance instructions for the horse collar are contained in NAVAIR TO 13-1-6-5.

*18.5.7.2 The horse collar can be used for single occupant recoveries from land or water. The horse collar can only be used to recover ambulatory personnel.

*18.5.7.3. Procedures:

*18.5.7.3.1 Connect one end of the horse collar to the hoist hook. The hoist hook safety pin may be removed to help the survivor don the horse collar. Do not lower the horse collar until established in a hover over the survivor. Do not stop the movement of the device until established on the ground/water due to potential erratic oscillations of the device caused by the rotor downwash. These oscillations may make it difficult to accurately place the device near the survivor, possibly creating a hazard to the survivor. Once the device is grounded and the survivor has connected the opposite end of the horse collar to the hoist hook, verify that the survivor is facing the hoist hook before raising them from the ground/water. When pulling the survivor into the helicopter, the crewmember must put their arm around the survivors waist to pull them safely inside.

***WARNING:** Use extreme caution when bringing the survivor into the cabin. Pulling on the survivor’s arm may cause the survivor to fall out of the horse collar.

***WARNING:** Do not lower an oscillating horse collar close to the intended survivor. Injury or death may result from striking the survivor with the free end of the device.

*18.5.7.3.2. NVG horse collar preparation. Tape one chemlight on the middle handle of the horse collar.

***NOTE:** Once the horse collar has been used in saltwater, it must be weight checked prior to the next mission.

18.5.8. Land Hoist.

18.5.8.1. Complete the hoist operator's checklist prior to starting final approach for hoist recovery.

18.5.8.2. If possible, establish a right-hand, rectangular pattern with a final approach oriented into the wind. This aids in keeping the survivor in sight while preparing for the pickup.

18.5.8.3. Keep the hoist operator informed of position in the pattern at all times. Likewise, the hoist operator informs the pilot when ready to deploy smoke markers or accomplish the pickup.

18.5.8.4. During descent at night or adverse conditions, the pilot not flying or flight engineer will call altitudes in 100-foot increments when above 300 feet AGL and 50-foot increments when below 300 feet.

18.5.8.5. The pilot not flying will monitor the engine instruments, help maintain adequate blade tip clearance, and remain oriented with the horizon throughout the hoisting operation to assist the pilot flying should the need arise. The hoist operator will assist the pilot in maintaining adequate rotor tip clearance to the rear and right side of the helicopter.

18.5.8.6. Monitor the hoist mechanism to ensure proper cable feedout and retrieval. Crew briefings prior to hoisting will include positive actions to be taken in the event of aircraft emergencies or equipment malfunctions. During training missions, terminate live hoisting immediately at the first indication of equipment malfunction. If possible, return the individual to the surface by lowering the aircraft. For actual SAR missions, existing circumstances must dictate actions to be taken. The hoist operator will advise the pilot, check hoist power sources and hoist controls, and request another crewmember to operate the hoist, if necessary.

18.5.8.7. Exercise the utmost caution during hovering operations to preclude anchoring the helicopter hoist hook or cable around an immovable object. The hook and cable should be kept in view at all times to prevent the cable from becoming entangled with ground objects. If the hook or cable should become fouled, attempt to free it by paying out slack and manipulating the hoist. Use caution when applying tension to the cable. If the cable should break, cable whiplash action can cause rotor damage.

18.5.8.8. When pulling the survivor into the helicopter, the easiest method is to turn the survivor's back to the helicopter and pull in. This procedure reduces the possibility of a semiconscious or injured survivor fighting the hoist operator. The rescue device should never be removed from the hoist cable or the survivor until the survivor is safely inside the helicopter and clear of the door.

18.5.8.9. To prevent dropping the rescue device, use the hoist hook safety pin. (EXCEPTION: When raising or lowering an empty stokes litter for water recoveries, the use of the safety pin is not required. This makes it easier to remove the litter from the hoist cable. Install the safety pin prior to hoisting the litter with a survivor.)

18.5.8.10. If a loss of power is experienced while hoisting, attempt to lower the person being hoisted to the surface. It may be necessary to cut the cable. Should an inadvertent landing occur, primary consideration must be given to moving away from personnel on the ground.

18.5.8.11. If interphone failure occurs between the pilot and hoist operator and cannot be remedied by changing interphone cords, have the copilot or another crewmember relay the hoist operator's signals to the pilot. The hoist operator gives directions by moving an open hand with the palm turned in the desired direction of movement. To hold position, clench the fist. The hoist operator can direct use of the hoist control or indicate hoist operation by extending the thumb of a clenched fist either up, down, in or out, as applicable. To indicate "survivor in and secure, and ready for takeoff," point in the direction of intended takeoff.

18.5.8.12. For MH-53 hover coupler operations, the FE may be directed to take control of the aircraft and operate the hover trim control. The hover trim control stick is immediately engaged upon notification from the pilot. Once positioned over the area, the FE may transfer control to the pilot for the appropriate operation.

18.5.9. Water Hoist Procedures.

18.5.9.1 In addition to the land hoist procedures, the following procedures will be used for water hoist recoveries day or night. Lack of depth perception and possible disorientation at night and in marginal weather require more precise patterns and procedures. Normally accomplish MH-53 water hoist operations with the landing gear down. MH-53 may be flown over water with the gear pinned down. The hover position for water hoist is directly over the objective. However, once the rescue device is lowered to the water, the pilot may elect to back to a holding hover. Once the survivor is ready for hoisting, the pilot should establish the hover over the rescue device prior to hoisting the survivor out of the water.

*18.5.9.2. After initial sighting of the survivor, maneuver to a position downwind of the survivor from which an observation pass or swimmer deployment can be accomplished (Figures 18.1 and 18.2). If swimmer deployment is anticipated, use low and slow procedures. If swimmer deployment is not required, make the observation pass above translational lift airspeed at approximately 50 feet AWL After the observation pass or low and slow, initiate a climb and turn right (left hand patterns can be used at the pilot's discretion) to downwind. Do not turn before reaching 50 feet AWL. Maintain 100 feet AWL minimum on downwind. Deploy sea dye or smoke markers as directed by the pilot. If OGE power is not available, a minimum of 50 KIAS and 50 feet AWL is required prior to initiating the turn to downwind. With OGE power, start the turn at a minimum of translation lift airspeed and 50 feet AWL. During the day, use sea dye instead of smoke markers to avoid detection during combat or when an oil or fuel spill is near the survivor. In high sea states or high winds, use of more than one sea dye is recommended.. If use of sea dye or smoke markers is prohibited or not required, proceed without them.

18.5.9.3. Do not descend below 100 feet AWL until established on final. If the survivor is not ready for immediate pickup, establish a holding hover approximately 100 feet downwind of the survivor or fly overhead patterns until receiving the recovery signal.

18.5.9.4. On final, descend to hover altitude and slow to approximately 5 knots forward hover speed 100 feet downwind from the survivor.

*18.5.9.5. For night recoveries (N/A PAVE LOW/AHHS), deploy a composite pattern . Proceed with a low and slow or set-up for a hoist recovery as required.

18.5.9.6. Precautionary Measures.

18.5.9.6.1. Conduct water training at approved water operating areas.

18.5.9.6.2. Conduct all water ops training a minimum of 100 yards offshore.

18.5.10. Inert Survivor Recovery. Hoisting procedures for the recovery of an unconscious or inert survivor from water or land areas are as follows:

18.5.10.1. If it is determined that the victim is unconscious or unable to enter the rescue device, the pilot directs a crewmember to be lowered to the survivor. The pararescue specialist, when available, is the primary crewmember for deployment to aid an injured or inert survivor.

18.5.10.2. The deployed crewmember will secure the survivor for hoisting and give a "thumbs up" signal to indicate that the survivor is ready for pickup.

WARNING: Inspect the entire length of the hoist cable any time live-hoist is anticipated. Throughout the entire recovery phase, the pilot not flying monitors the flight instruments and advises the pilot when reaching the altitudes, airspeeds, and rates of descent prescribed. When in a hover, the pilot not flying cross references the attitude indicator with visual references. If the pilot flying becomes disoriented, initiate an instrument takeoff or direct the other pilot to assume control of the aircraft.

NOTE: Pulling the landing gear warning system circuit breaker on the H-53 is not authorized.

18.5.11. Shipboard Hoist Procedures.

18.5.11.1. If the ship does not have a suitable landing area or if rough seas will prevent a safe landing, a hoist recovery is necessary.

18.5.11.2. After arriving on scene, make observation passes as necessary to:

18.5.11.2.1. Identify the ship.

18.5.11.2.2. Check the ship's superstructure for poles, antennas, cables, smoke stacks, and any other hazards to a hover.

18.5.11.2.3. Confirm the location for survivor recovery or select a better one.

18.5.11.2.4. Complications and problems associated with hoist pickups usually are the result of poor planning and the use of untrained personnel aboard the vessel. These problems may be minimized by prebriefing the crew of the vessel by radio, message streamers, or, if required, by lowering a crewmember with a radio onto the vessel. Brief these items:

18.5.11.2.4.1. Course of vessel. Normally, the ship should steer to put the wind 30 degrees off the port (left) bow. However, this may have to be varied depending on available hover references.

18.5.11.2.4.2. Speed of vessel. The vessel should maintain minimum forward speed (idle or steerageway speed) in calm areas. Slightly higher speeds are required in higher seas.

18.5.11.2.4.3. Pickup location (bow, amidships, stern).

18.5.11.2.4.4. Type recovery device.

18.5.11.2.4.5. Signals to indicate the survivor is securely attached to the device, etc.

18.5.11.3. Compute power available and power required for an out-of-ground effect hover.

18.5.11.3.1. Make an approach to a hover astern of the ship and establish a hover at the same speed as the ship. Avoid hovering directly downwind of the funnel where hot, choking stack gas and smoke may be encountered or downwind from any large superstructure where turbulence and downwash may be present. Watching the ship's wake may induce vertigo.

18.5.11.3.2. Check power to hover.

18.5.11.3.3. Observe sea state versus ship pitch-and-roll pattern. When the ship is light and seas heavy, the pitch-and-roll cycle will vary from stable to violent. By observing this pattern, a stable period may be chosen for crewmember placement and recovery from the ship. Select the most stable part of the ship for a recovery; in most cases, superstructure permitting, it will be amidships. Close observation and coordination between the pilot and hoist operator are required during this type of operation.

18.5.11.3.4. Hover taxi to the pickup location over the ship. Use of a tag line may facilitate the recovery.

18.5.11.3.5. If recovering an injured person, it may be necessary to deploy a PJ with a radio to make a medical evaluation and assist shipboard personnel with the recovery. The PJ determines what type of recovery equipment is required and supervises loading of the patient. After the PJ is on the vessel and clear of the hoist, recover the device and move to the observation position to await further instructions. If the stokes litter is used, disconnect it from the hoist for patient loading. Recover the hoist and deploy it again when ready for hookup. Do not allow the hoist cable to be secured to the ship or taken below decks. After the patient is recovered, if conditions allow, recover the crewmember.

18.5.11.3.6. Whenever observing or signaling the vessel, or while waiting for the survivor to be prepared for hoist operations, move to an observation position. Hover to the left and rear of the vessel where you can adequately observe activity on the vessel and where rotor wash will not affect recovery operations.

18.5.11.3.7. The helicopter crewmember will signal the helicopter back in for the pickup and will specify the type of recovery device. The crewmember should keep the shipboard personnel away from the rescue device as it approaches the deck. Ground the device prior to handling.

18.5.11.3.8. The RCC or OCC accomplishes all coordination for medical assistance. Case history, vital signs, and medication administered should be passed to the hospital.

18.5.11.3.9. Night pickups may be complicated by inadequate lighting of mast, booms, or rigging.

18.5.11.3.10. An escort aircraft, especially on long-range missions, is very desirable. If weather and numerous ships are in the recovery area, excessive time can be consumed locating and identifying the vessel.

18.5.11.3.11. To aid in location and identification, request the ship to shine a searchlight beam vertically or display flares when the aircraft arrive in the area.

18.5.11.3.12. Reduced depth perception at night makes approach to a ship difficult. Fly a racetrack pattern using the ship as a reference. Be prepared to fly the entire pattern, until final, solely on instruments, especially when there is no visible horizon. During descent, the copilot calls out altitude in 100-foot increments when above 300 feet AWL and 50-foot increments below 300 feet AWL. As the ship is approached, enter a hover astern above the deck.

18.6. Rappelling. Rappelling is faster than hoist operations thus reducing aircraft exposure in a tactical environment. Position a safetyman to monitor the rappell opperations. The safetyman will relay communications, monitor the deployed ropes to ensure ground contact is maintained, and recover or release the ropes when rappelling is complete. Pad or tape any sharp edges that could damage the ropes. Deploying personnel are responsible for aircraft rigging and proper hookup of rappellers.

18.6.1. Installation.

18.6.1.1 MH-60:

18.6.1.1.1. The anchor points are the four cabin rappelling fittings and the upper cargo net attaching rings. If the cargo net attaching rings are used as anchor points, install the overhead "I" cable.

18.6.1.1.2. Attach all ropes to the anchor points using locking carabiners.

18.6.1.2. MH-53:

18.6.1.2.1. When rappelling from the crew entrance door, the ropes are connected in sequence with locking carabiners to the 10,000 and 5,000 pound tiedown rings at station 182 through the fast rope quick release attached to the hoist base plate IAW Figure 18-3.

18.6.1.2.2. When rappelling from the ramp, the ropes are connected in sequence with locking carabiners to the 20,000 pound tie down rings at station 462 and the 10,000 pound tiedown rings at station 502 on the left and right side of the aircraft through the fast rope quick release system on the fast rope bar IAW figure 18.3. Simultaneous rappelling from left and right side is authorized.

18.6.2. Operating Procedures.

18.6.2.1. The safetyman will monitor intercom and be secured with a gunner's belt.

WARNING: For MH-53 operations, ensure the aircraft maintains at least a 25 foot hover height during rappel operations to avoid rotor downwash from blowing the ropes into the main or tail rotor system.

NOTE: The cargo hook door may be opened and the hook placed in the down position to provide a view of the rappellers during descent.

18.6.2.2. Once hooked to the rappelling equipment, personnel may release other restraints in preparation for the exit. On short final, personnel may position themselves to facilitate immediate deployment.

18.6.2.3. Do not deploy ropes until the aircraft is in a stable hover over the intended deployment area.

18.6.2.4. As the aircraft comes to a hover, the pilot flying will give the command "ROPES, ROPES, ROPES." At this time, the safetyman will relay the signal by yelling "ROPES" and pointing a finger/chem-light out the door.

WARNING: The safetyman will ensure that the ropes reach the ground prior to final positioning of rappellers for deployment. The safetyman will coordinate with the pilot to ensure the aircraft maintains a hover altitude that will keep the ropes in contact with the ground.

18.6.2.5. After the last rappeller is off the rope, the safetyman will release the ropes.

CAUTION: Release ropes prior to commencing forward flight to prevent possible entanglement. The MH-53 will release ropes before landing.

18.6.3. Safety Procedures.

WARNING: When unsafe condition is encountered, stop any additional team members deploying from the aircraft. Make no attempt to physically stop a person in the act of deploying as this may cause the person to lose grip of the rope and increase the probability of injury to the team member.

18.6.3.1. If the helicopter experiences an emergency during rappelling, the rappellers on the rope will descend as rapidly as possible and move from beneath the helicopter.

18.6.3.2. If the helicopter gains altitude above the length of the rope, the rappeller will immediately brake and lock-in, awaiting helicopter descent to a safe rappelling altitude.

18.6.3.3. The V-blade knife or other similar tool should be readily available to cut ropes during emergencies or rope entanglement.

18.7. Fast Rope. Fast rope procedures allow the rapid insertion of large numbers of personnel, limiting aircraft, and personnel exposure. Crew duties and coordination, time warnings, and deployment clearance are the same as rappelling procedures. The aircrew will install ropes and inspect attaching points. For MH-53s, accomplish the Hoist Power On Preflight Checklist if the hoist is used for fast rope operations (entire length of cable need not be checked). The deploying team is responsible for providing and inspecting ropes.

CAUTION: Ensure the quick release system is operable.

18.7.1. Rope Description. The ropes are interwoven hemp with a diameter of approximately 2 inches and a hookup point on one end. Lengths will vary, depending on the needs of the mission (terrain, tactical environment, user requirements, etc.). There are two different types of hookups. One rope is looped and braided back into itself. The second type has a sleeve slipped over the end with two bolts passing through the sleeve and rope. At the end of the sleeve is a metal ring on a swivel.

18.7.1.1. The forward rope can be used on any MH-53 aircraft with an operable hoist. The rope is simply hooked into the hoist's hook. The hoist hook safety pin need not be installed for fast rope operations. Modified H-53s have a forward quick release system separate from the hoist system.

WARNING: H-53s must be configured with 650-gallon external fuel tanks when conducting fast rope operations off the ramp. Exception: H-53As may conduct fast rope operations off the ramp providing center of gravity limits are not exceeded.

WARNING: It is the aircraft commander's responsibility to ensure that all crewmembers are aware of the length of the ropes. Failure to do so may result in serious injury to deploying personnel or damage to the aircraft.

18.7.2. Cabin Configuration. Ensure the cabin is configured for the number of personnel and type of mission. Deploying personnel may be secured to the cargo compartment floor using aircraft seat belts or alternate loading restraints.

18.7.3. MH-53 Cabin Configuration.

18.7.3.1. Hand Rails. Each hand rail consists of two 5000-pound aircraft tiedown straps. The straps run from the top of the fast rope bar to half way down the cabin, hooking into the center compartment wall brackets (litter hookup brackets along cabin wall).

18.7.3.2. Overhead Support Straps. The straps are tiedown straps hooked to the overhead litter strap rings to help balance the deploying individuals.

18.7.3.2.1. These straps (one on each side) run from the overhead litter strap rings just forward of the ramp to a ring just aft of the transmission. Secure the strap midway, to an overhead ring, to help reduce the amount of slack.

18.7.3.2.2. When exiting from the right door a third tiedown strap is run from an overhead litter strap ring by the crew entrance door to the overhead ring just forward of the transmission.

18.7.4. With Weapon Systems Installed:

18.7.4.1. MH-60:

18.7.4.1.1. .50 Caliber. With the .50 cal installed in either cabin door, that door is not usable for fast rope operations.

18..7.4.2. MH-53:

18.7.4.2.1. .50 Caliber. When using 100-round ammo cans the right and left aft ropes may be used. Prior to deployment, ensure the weapon is pointed to the six o'clock position. When using the floor mounted ammo can and the left aft rope is required, the ammo feed chute must be disconnected and stowed.

18.7.4.2.2. GAU-2B/A (Minigun). The right aft rope may still be used.

18.7.4.2.2.1. If the left aft rope is required, the ammo feed chute must be disconnected and stowed.

18.7.4.2.2.2. Secure the ramp minigun in the firing position facing the six o'clock position.

CAUTION: When deploying personnel from the ramp with weapons installed, there is a risk of hang-up on the ammo can or weapon itself. If a hang-up on a weapon occurs, especially the .50 caliber, the weapon may turn facing the other rope and block that rope. The aft safetyman must be prepared to render assistance which may include pulling the hung person into the aircraft to untangle them from the weapon or the ammo can.

18.7.5. Deployment Procedures. The following procedures are recommended for day or night deployments, but may be altered to suit the mission. Thoroughly brief any changes to these procedures prior to deployment.

NOTE (MH-60): The team leader may require more than the minimum time calls. The team leader should be on intercom until at least the 5 minute call. The FRIES bar will be extended and locked prior to the 5 minute call.

18.7.5.1. The rope may be attached to the H-60 FRIES bar before takeoff or any time during the flight, as the mission dictates.

18.7.5.2. Secure the ropes during flight prior to insert.

WARNING: Rope must be coiled toe to head.

18.7.5.3. At the "1-minute" call, all team members will move into position for deployment.

18.7.5.4. On final, the pilot will maneuver the aircraft over the target, terminating in a hover. The type of maneuver flown is dependent on the tactical environment. The approach can vary from a slow gradual deceleration and descent to a tactical approach. It is important that, if a tactical approach is flown, the aircraft should be flared once and, at the completion of the flare, the aircraft should be in a stabilized hover altitude with no more than 5 knots of forward ground speed, if required. The team and infil area size will determine if slow forward drift is required during team insertion. A large team may need rope movement to prevent pile ups. The pilot will only call "ROPES, ROPES, ROPES" when he has ensured that the aircraft is at the correct altitude. The appropriate scanners will give the hand/chemlight signal for the rope deployment, verify the rope is on the ground and then clear the team out.

The first man of each team will kick out the rope, determine that the rope is on the ground, then exit the aircraft. As the last man touches the ground, the safetyman is cleared to release the ropes or pull the ropes back in.

18.7.5.5. Since the aircraft altitude will change as the weight of the aircraft changes, altitude trend information is essential and normal crew coordination procedures should be used to maintain a stable hover clear of obstacles.

WARNING: Altitude deviations while personnel are on the ropes will have an adverse effect on their braking ability and can cause serious injury. During the hover, the scanners must relay sufficient information to the pilots to ensure the ropes do not leave the ground during altitude deviations. The importance of a stabilized hover cannot be overemphasized.

WARNING (MH-53): Due to the nose-up attitude of the aircraft, any hover altitude changes should be made by the forward safetyman, if possible. If the aft safetyman calls for a correction the forward rope could be raised off the ground. If the aircraft is below 25 feet AGL, the aft ropes will blow up due to the ground effect.

NOTE (MH-53): During final approach, when deploying large numbers of personnel from aft stations only, the aircraft will pitch up faster than normal due to the aft CG. This does not cause a control problem, but the aircraft will decelerate faster than expected. This pitch up must be anticipated or the aircraft will stop short of the target.

NOTE: Initiate necessary go-arounds as soon as possible. Normal go-around procedures should be used.

NOTE: The pilot flying must be the one who calls "ROPES, ROPES, ROPES" since he knows precisely when the nose will be rolled over. The safetyman must ensure that the ropes are not deployed until the pilot calls for them.

18.7.5.6. Recovery from the hover should be accomplished in the following manner. If the ropes are to be recovered, the pilot should maintain his hover while the ropes are retrieved. Scanners will advise the pilot when ropes are in and secured. If the ropes are to be released, the scanners will pull the pit pin and pull the quick release handle on the FRIES bar. Scanners will advise the pilot when all ropes have been released. The pilot will depart using normal procedures when advised that the ropes have been secured or released.

WARNING: When using the rope with the sleeve and metal ring, ensure all personnel are cleared from below the aircraft before releasing the rope.

WARNING: If doing multiple deployments or landing on the deployment site, all scanners should ensure that the deployed individuals are cleared from below the aircraft prior to landing. This is especially critical during night deployments when injured personnel may be hard to see on the ground.

NOTE (MH-53): When released, the aft ropes will drop back and right 10 to 20 feet.

18.7.6. Night Deployments. Procedures remain the same. Use chemlights to identify ropes and exits.

*18.7.6.1. Use four chemlights on each fast rope. Tape two at the bottom and one 10 feet from the bottom. The chemlight 10 feet from the bottom ensures that at least 10 feet of rope are on the ground. The chemlights should be taped over to provide just enough light for the safetyman to ensure the rope is on the ground. Tape a single chemlight to the top of the rope to aid the team in the location of the fast rope.

18.7.6.2. MH-53 cabin configuration:

18.7.6.2.1. On the ramp, tape a chemlight horizontally to the avionics rack. Face forward and in line with each fast rope. Place a piece of tape on the bottom side to ensure no one on the ground or aft of the ramp will see it.

18.7.6.2.2. On ropes attached to the hoist, tape a chemlight vertically to the rubber boot of the hoist cable or the top of the rope. Tape a "V" at the bottom to give an appearance of an arrow pointing down.

18.7.6.2.3. A chemlight may also be taped horizontally just above the crew entrance door in line with the rope. Place a piece of tape on the bottom side to prevent observation by hostile personnel on the ground.

NOTE: Depending on the customer, a slow forward movement of the aircraft may be requested to assist in deploying personnel.

18.7.7. NVG Overwater Operations. The fast rope pattern is a variation of the water operations pattern. On final, descend to desired hover height while decelerating to deployment ground speed. Deploy the fast rope upon entering the insertion zone. Once personnel are deployed, start a slow accelerating climb to allow recovery of the fast rope.

18.7.8. Other Considerations.

18.7.8.1. Ensure comm cords are clear of pathways. The team leader's cord should be just long enough for necessary movements.

18.7.8.2. Ensure gunner belts are clear of personnel and paths of travel. On the ramp (H-53), hook up on the overhead rings. A "Y" strap should be used for the ramp safetyman. The “Y” strap is not available though supply channels and must be locally manufactured by the unit. Weight test and inspect the strap using the criteria listed in TO 13A1-1-1 for the personnel restraint harness. The “Y” strap is hooked between the two litter strap rings with a gunners belt hooked in the center. An intercom cord may then be routed from above and taped to the belt.

18.7.9. Aircrew Procedures.

18.7.9.1. Pilots should alert the scanners with prebriefed time warning calls (i.e., the 20-, 10-, 5-and 1-minute calls).

18.7.9.2. Safetymen should ensure the ropes have been back coiled on the floor in position for deployment. Both the ropes and deploying personnel should be positioned and ready for deployment at the one minute call. Safetymen will relay time calls to the personnel to be deployed.

WARNING: Do not fire weapons located at the deployment stations during personnel deployment from those stations.

18.8. Rope Ladder. Use a rope ladder to extract personnel from water or land recovery zones. Ladder operations offer an alternate to hoist recovery.

18.8.1. Installation. The flight crew is responsible for providing, inspecting, and rigging rope ladders. Secure the ladders to the aircraft at the desired length (see Figure 18.4). Ladders will be held off the cabin floor utilizing rubber donuts or other suitable devices. This is to provide a handhold for personnel where the ladder comes into contact with the cabin floor. Ladders will be rolled up and secured before flight. For night operations, a chemlight should be attached to the side of the first ladder tube from the trailing end.

18.8.1.1. MH-53 rope ladder installation procedures:

NOTE: MH-53 rope ladder extractions will not normally be performed over salt-water due to possible engine power deterioration.

18.8.1.1.2. The ladder may be attached using steel carabiners and a cargo tiedown strap with a minimum of four wraps around the step providing the desired length. When installing the rope ladder utilizing a cargo tiedown strap on the ramp of the H-53, use the “L” configuration installation (Figure. 18-4). Two carabiners are required for this type installation. One carabiner is used to guide the cargo tiedown strap. The second one is used to secure the ratchet handle of the strap to the tiedown ring.

WARNING (MH-53): When using cargo tiedown straps to attach ladders to the aircraft, do not use a strap that has any sign of grease or oil contamination or corroded hardware. Crewmembers will have a suitable cutting device readily available to ensure a means of releasing or jettisoning the ladder in case of an emergency.

18.8.1.2. Rapid release device for the rope ladder.

18.8.1.2.1. Ensure that the fastening bolts that hold the device body together are facing upward away from the cabin floor. This will ensure proper seating of the safety pit pin.

18.8.1.2.2. Ensure that the two metal pins that protrude from the top of the device when the latch is in the open/release position are flush with the device body when the latch is in the closed/locked position.

18.8.1.2.3. For MH-53s. two 5,000 pound locking carabiners are also required for using this device to install the rope ladder. The carabiners are for attaching the device to the cables of the ladder at the desired length.

18.8.1.3. Rope Ladder Inspection (Random Tech Rope Ladder). Check for oil or grease on the cabin floor. Check ladder for frayed cable/fabric. Ensure all aluminum tubes are secured to the cable/fabric and check for cracks. Check for any sharp pieces of metal or extending wires which may cause cuts or scratches.

18.8.1.4. Rope Ladder Inspection (Quick Release Rope Ladder). Inspect exterior of quick release device, ensure that it is serviceable (i.e. no cracks, corrosion, etc.). Inspect all bolts for loosening or failure (if any have failed, DO NOT attempt to re-tighten, reject device for use), snap hooks for proper double locking operation, pit pin for proper operation and seating, attachment cables for wear and fraying and cams for wear and fracture. Check handle attachment bolts for tightness.

18.8.2. Operating Procedures.

18.8.2.1. Over Land. Use normal procedures for approaches to and departures from the LZ. The pilot flying will hover over the LZ or team and notify safetyman when cleared to deploy the ladder. The safetyman will monitor the team and keep the pilot advised of their progress, to include number of personnel on the ladder, last man in, and ladder retrieved and secured and cleared for forward flight.

CAUTION (MH-53): Limit the number of personnel on the ladder at any one time. The excess weight could cause aircraft control or CG problems. The recommended limits for the H-53 is five forward and five aft.

18.8.2.2. Over Water.

18.8.2.2.1. Ladder deployment and retrieval is the same as over land; however, it may be necessary for the team to position themselves along the wind line at approximately 25-foot intervals between team members to allow the pilot to hover taxi the aircraft for pickup. Hover taxiing at approximately 2 to 5 knots will reduce water spray and aid in a more rapid exfiltration of personnel. For night water operations, the rope ladder pattern is a variation of the water operations pattern. At night, the team will use chemlights attached to their arm to position themselves and also allow the pilot and crew to maintain visual contact with team members. Altitude of the aircraft will depend upon ladder length. The safetyman should monitor the ladder to ensure at least two steps are in the water prior to reaching the first member and advise the pilot of required altitude changes to maintain this position. As the ladder is trolled through the water, personnel will grab the ladder and ascend immediately.

18.8.2.2.2. Once on final, descend, decelerate and deploy the rope ladder. Slowing to a hover momentarily may be required to enable personnel to climb onto the rope ladder. Once personnel are onboard, recover ladder and climb out to cruise altitude.

18.8.2.3. Emergency Procedures.

18.8.2.3.1. In the event the ladder becomes entangled on the ground and aircraft control is questionable, it may be desirable to remove the pit pin and release the ladder. Aircraft and personnel safety will determine the course of action to be taken. The decision to jettison the ladder will be at the command of the aircraft commander or as briefed.

18.8.2.3.2. If the aircraft begins settling with personnel on the ladder, they should remain on the ladder until the ground or water is reached. They will then get off the ladder and move from beneath the helicopter toward the three o'clock position. The pilot should attempt to move the helicopter forward and away from personnel.

18.8.2.3.3. In an emergency or if the aircraft comes under fire, personnel will secure themselves to the ladder and the aircraft may depart the immediate area. Slow forward flight to a safe area should be accomplished if flight characteristics and power requirements allow. Care should be taken during forward flight due to the twisting and turning of the ladder. Airspeed should not exceed 60 KIAS.

18.9. Special Patrol Insertion and Extraction (SPIE) Operations. The SPIE system was developed to rapidly insert or extract team members from an area where landing is not possible. SPIE procedures can be used for rough terrain as well as water operations. Team members, each wearing a harness with an attached snaplink, hook into the FRIES/SPIE rope. The helicopter lifts vertically until the personnel and the rope are clear of all obstructions and then transitions to forward flight. Airspeeds, altitudes, and oscillations must be closely monitored.

18.9.1. MH-60 installation procedures:

18.9.1.1. Description: The FRIES rope is a standard fast rope with nylon rope innerwoven to form three extraction loops at the bottom. The rope is supplied in three standard lengths (60, 90, and 120 feet).
This fast rope is designed to extract two 250 pound personnel on each extraction loop (5 personnel per FRIES). To conduct SPIE operations using the FRIES bar system, the FRIES bar must be pinned in the intermediate position. The white hook-up loops are primary and the black hook-up loops are secondary.

WARNING (MH-60): Do not exceed the specified weight limit of the FRIES bar.

18.9.1.2. For night operations, attach chemlights to the rope assembly. Use three chemlights; tape two chemlights at the bottom of the rope and one chemlight 3 feet above the top set of innerwoven extraction loop attachment points.

18.9.2. MH-53 installation procedures:

***WARNING (MH-53):** The MH-53J fastrope bar, hoist mount, and FRIES equipment have not been tested for forward flight with personnel attached to the FRIES. Until procedures and equipment for FRIES have been validated, do not use the fastrope bar, hoist mount, or FRIES equipment for extraction operations.

18.9.2.1. Description. The SPIE rope assembly (NSN: 1670-01-065-0851) is approximately 120 feet in length and consists of a doubled tapered eye splice at each end. The top tapered eye is encapsulated in polyurethane to protect it from abrasions. D-rings are located in pairs on opposite sides of each other, spaced one foot apart and seven feet from center of one set to center of the next set. Four additional D-rings can be added to the rope if needed to provide a total carrying capacity of 14 personnel. The rope assembly has a tensile strength (dry) of 24,000 pounds and a recommended maximum load of 5,000 pounds.

18.9.2.1.1. Two 9-foot, cargo suspension slings (NSN: 1670-00-856-0266) are routed through the top tapered eye of the rope assembly and secured to the four Type IV links (NSN: 1670-783-5988/MIL-L40085). The cargo slings are passed through the encapsulated eye of the SPIE rope and attached to the 20,000 pound tiedown rings at station 322 and 342 on the right and left sides of the cabin floor (MH-53J).

18.9.2.1.2. Pad the entire left edge of the cargo hook well with appropriate material (i.e. two thickness' of one half inch hair-felt pads, carpet, fire hose, etc) to prevent damaging the SPIE rope.

18.9.2.1.3. For night operations, attach chemlights to the SPIE rope assembly. Use three chemlights; tape two chemlights at the bottom of the rope and one chemlight 3 feet above the first set of D-ring attachment points.

18.9.3. Operating Procedures.

18.9.3.1. Over Land.

18.9.3.1.1. Once the helicopter is established in a stabilized hover at an altitude to put a sufficient amount of rope on the ground, the AC will call for the rope to be deployed. The FE or AG will deploy the rope, monitor the team and keep the pilot advised of the team's progress.

18.9.3.1.2. The team members will hook into the D-rings/innerwoven loops and turn to face the direction the rope is headed. Each team member will pass a "thumbs up" to the team leader. When all members are secure and ready, the team leader will give the FE or AG a "thumbs up." At night, prearranged light signals may be used. If possible, the team radio operator will hookup close to the bottom of the rope and maintain FM radio contact with the helicopter in order to provide a verbal backup for the extract, the clearing of obstacles, and the descent into the LZ.

18.9.3.1.3. The FE or AG will clear the pilot for vertical ascent using standard voice commands and notify the pilot as each member clears the ground. When the last member is airborne, the pilot should make specific note of the radar altimeter reading to determine obstacle clearance and to assist during the insertion process. Once the SPIE rope is clear of all obstacles, the pilot will slowly accelerate to 40-60 knots (do not exceed 70 knots or 50 knots in cold weather) and proceed to a secure area. Recommend a 200 foot clearance be maintained between the bottom of the SPIE assembly and any ground obstacles, tactical situation permitting.

18.9.3.1.4. Upon reaching a safe area, the pilot will transition to high hover and descend vertically as the FE or AG relays distance to ground information. Aircraft rate of descent should be less than 5 feet per second. As each team member reaches the ground, they will immediately move out from under the man or men above them and unhook themselves as rapidly as possible. The FE or AG will retrieve the rope prior to the helicopter departing the area or landing in the LZ.

WARNING: Extreme care must be taken while making an approach to a high hover with a very slow rate of descent during the insertion to avoid the possibility of encountering power settling.

NOTE: A landing can be made with the rope attached to the helicopter. The team members, once unhooked, keep the rope taut by walking it out to the three o'clock position as the helicopter makes a slow descent.

18.9.3.2. Over Water.

WARNING: The tensile strength of the rope is reduced once it has gotten wet.

18.9.3.2.1. The SPIE is also suitable for the extraction of swimmers from the water. For this procedure, tie three LPU bladders or any type of flotation device to the SPIE rope to provide buoyancy for the rope while in the water.

18.9.3.2.2. After the pilot has established a stable hover over the swimmer's location, the FE or AG will deploy the rope with flotation devices attached. When the team members have completed their hookup, the team leader will signal the FE or AG with a "thumbs up" to commence the lift off.

18.9.3.2.3. The pilot will initiate a vertical climb until all team members are clear of the water. After takeoff, flight speeds, altitudes, and insertion procedures are the same as for over land. (**EXCEPTION:** If the insertion is to a ship, the team members must take their landing orders from the personnel in charge of the landing platform).

NOTE: Swimmers should allow the rope to contact the water to discharge any static electricity prior to attempting to hook up to the SPIE rope.

18.9.3.3. Safety Procedures.

18.9.3.3.1. Should a team member develop an emergency during an extraction, the team member will place both hands on top of his head to inform the crew. The pilot will lower the team member to the ground or water as safely as possible.

18.9.3.3.2. Airspeeds shall not exceed 70 knots or 50 knots during cold weather operations. At least one operable radar altimeter is required to maintain obstacle clearance between ropers and the ground.

18.9.3.3.3. The lower strobe light must be off while conducting SPIE operations. Should the helicopter develop an emergency, turn on the lower strobe to alert the team members. Then, lower the ropers to the ground. Once on the ground, the team will unhook and depart to the three or nine o'clock position. The helicopter, if possible, should move away from the team.

18.9.3.3.4. Maximum flight time with personnel on the rope is 15 minutes.

18.9.3.3.5. The MH-60G FRIES bar has three pinned positions: stowed, intermediate (used for insertion or extraction), and fully extended (for insertion only).

18.10. Helo Cast and Combat Rubber Raiding Craft (CRRC*)* Delivery Operations:

18.10.1. Use the following procedures for delivering CRRCs from the MH-60:

18.10.1.1. The following procedures are for delivering Tethered ducks (T-Duck):

18.10.1.1.1. General. These procedures are guidelines for the deployment of a Zodiac boat and personnel from the cabin during either day or night. A deflated Zodiac, with the motor attached, is deployed while established in a hover over the water. The boat's descent to the water is controlled by a caving rope and rappelling hitch. Personnel are deployed by either fast rope or low and slow depending on hover height and user preference. Additional required equipment is lowered to personnel following the release of the boat.

NOTE (MH-60): Teams may choose to have one or two team members ride the Zodiac as it is being lowered into the water. This is to expedite the inflation of the Zodiac once it reaches the water. This technique results in increased risk for the team members and will be performed at the discretion of the Squadron Commander/DO (Mission Commander while deployed) and the team involved. This maneuver will be thoroughly briefed prior to performing the insertion. The hover height will be discussed during the team brief but, at no time will the hover height exceed 20 feet. This is to ensure minimal injury to team members if they should fall from the Zodiac.

18.10.1.1.2. Equipment Installation and Configuration.

18.10.1.1.2.1. The Zodiac is prepared by the user. A harness holds the boat in its rolled configuration. This harness is equipped with a single point quick release which also serves as the attaching point for lowering the boat.

18.10.1.1.2.2. Preparation of the aircraft cabin is accomplished by the user under the supervision of the FE. Required equipment is a standard FRIES bar, lowering rack system, chemlights, and a caving rope. Ropes should be compatible with intended hover height. Any equipment lowered after the boat should have hardware compatible with the quick release buckle.

18.10.1.1.2.3. A standard fast rope is attached to the right side of the FRIES bar. Personnel are alternate loaded with seat belts or approved restraints.

18.10.1.1.2.4. The Zodiac is loaded through the left cabin door with the motor facing out the left side.

18.10.1.1.3. Aircrew Procedures.

18.10.1.1.3.1. Standard fast rope and low and slow procedures should be used for personnel deployment.

18.10.1.1.3.2. The FRIES bar should be extended to the intermediate position and ready for deployment prior to the 5-minute call.

18.10.1.1.3.3. The recommended altitude is 20 feet AWL.

18.10.1.1.3.4. Boat and personnel deployment procedures should be thoroughly briefed with the personnel involved.

18.10.1.1.3.5. The ropeman should be on interphone during equipment deployment, or understand the prebriefed hand signals and emergency procedures.

18.10.1.1.3.6. During night deployments, chemlights are recommended for equipment identification. Chemlight colors should be controlled to avoid confusion between types of equipment, emergency exits, etc.

18.10.1.1.3.7. The weight of the boat or any other load to be lowered from the FRIES bar will not exceed 1300 pounds.

18.10.1.1.3.8. When the aircraft is established in a hover over the intended drop off point, the pilot will clear the cabin crew to begin the deployment. After ensuring the boat caving rope is manned, the personnel in the cabin will slide the boat out the left cabin door. The ropeman lowers the boat to the water. One or more persons then deploy out the right door and release the boat from the caving rope. The remaining personnel deploy from the right side while any additional equipment (rucks, spares, radios, etc.) is attached to the caving rope and lowered to the water. Recover or release the fast rope before the aircraft moves into forward flight.

18.10.1.1.3.9. Personnel may low and slow if a sufficiently low hover can be maintained; however, this is not recommended due to increased injury potential.

18.10.1.1.4. Emergency Procedures.

18.10.1.1.4.1. Brief all personnel involved in the deployment concerning the actions required of them in the event of an emergency.

18.10.1.1.4.2. Make a V-blade knife available in the cabin area during equipment deployments.

18.10.1.2. The following procedures are for delivering Kangaroo Ducks (K-Duck):

18.10.1.2.1. General.

18.10.1.2.1.1. These procedures are for delivering a fully inflated zodiac boat (combat rubber raiding craft-CRRC) and a team during day or night operations. The fully inflated CRRC is placed on a canvas harness and then the H-60 (with it's lower main landing gear struts inflated to the Rapid Deployment Force(RDF) extension) hovers over the CRRC and lands on top of it. The CRRC is then cradled to the belly by attaching the harness to the FRIES bar. The team is carried inside the cabin. The team's equipment, to include the motor for the CRRC, is securely stowed inside of the CRRC. Upon reaching 10 feet and 10 knots GS (maximum), the shear strap of the harness is cut, the CRRC is deployed and the team exits the helicopter.

18.10.1.2.2. Aircrew Requirements.

18.10.1.2.2.1. All aircrew members must be water operations current and qualified. If the maneuver is to be flown at night, all aircrew members must be night water operations current and qualified. Aircrew members in the applicable water upgrade for their crew position, flying with a qualified instructor, may be used for this maneuver (all water upgrade ground training will be completed prior to accomplishing this maneuver).

18.10.1.2.3. Equipment Installation and Configuration.

18.10.1.2.3.1. Helicopter Preparation.

18.10.1.2.3.1.1. Inflate the lower main landing gear struts to the RDF extension.

NOTE: With the struts inflated to the RDF extension, the functions of the weight-on-wheels switch is inoperative. It is important to remember that the RPM warning horn will sound throughout the run-up, the leak isolation system cannot be checked and the INS will not align. Keep ground operations and landings to a minimum. Hover taxi as much as possible and keep landings as gentle as possible.

18.10.1.2.3.1.2. Inspect the bottom of the H-60 and remove/stow any antennas which may interfere with the CRRC. Fold and safety wire (if installed) the VHF multi-band antenna to the stowed position.

18.10.1.2.3.1.3. Ensure the FRIES bar is properly installed and pre-flighted.

18.10.1.2.3.1.3.1. With the FRIES bar installed, ensure that the FRIES bar is in the stowed position. Locate the two release points on the I-Bar approximately 60 inches apart. Remove their safety pins so that they are free to rotate fore and aft. Insert a medium clevis assembly/rappel rings. Reattach the removed leg of the crows feet connector link. The two connector links must be to the outside of the clevises/rappel rings.

NOTE: Safety wire/tie strap connector fasteners together to keep them from backing out during flight.

18.10.1.2.3.2. CRRC Preparation.

18.10.1.2.3.2.1. Install the floors (also the wooden bow floor) and fully inflate the zodiac.

WARNING: Externally transporting the CRRC without the floor installed could cause the CRRC to fold up and possibly contact the helicopter rotors. **DO NOT** transport the CRRC without the floor installed. The optional floor extension is only necessary if it is desired to travel in excess of 130 knots.

18.10.1.2.3.2.2. Lay the cradle of the harness flat on the ground. Place the CRRC on the cradle such that the bow of the zodiac is at the triangular end of the harness. Lines 1 and 2 should be at the front handles and lines 3 and 4 should be at the rear handles (see figure 18.5).

18.10.1.2.3.2.3. Prepare and stow the motor with the motor arm down and strap the engine in place near the transom. Use some suitable padding between the motor and floor, and pad the prop. Make sure the paddles and gas tanks are placed in their positions and tied down. Accompanying payload will be put into the boat as close to the center as possible. Do not store more than 50 pounds in the bow, even with the wooden floor installed. All items must be in the zodiac completely so that only the boat will touch the H-60 belly. If payload items are large, tie the capsize line, of one inch tubular nylon, to the front towing ring. Run the line through each large item and tie off the

line on the last item making sure that the free end of the line can reach the transom. All small items will be snap linked to the floor or tied to a larger item. Pad all items that need it.

18.10.1.2.3.2.4. Route lines 1 and 2 through the front handles, attach together, and tighten. Fold and tape the excess nylon to the quick fit ejector.

18.10.1.2.3.2.5. Route line 5 through the front towing ring and over the bow then run the line under lines 1 and 2. Bring line 6 over the transom and lines 3 and 4. Attach lines 5 and 6 with the ratchet.

18.10.1.2.3.2.6. Route the nose strap, line 20, through the loop located on line 5 at the nose of the zodiac and below the front towing ring. There should be an even length of the line inside the zodiac such that they can be easily accessed once the helicopter has landed on top of the CRRC.

18.10.1.2.3.3. CRRC Hookup (see figure 18.5).

18.10.1.2.3.3.1. As the helicopter approaches, the hookup crew should lean on the CRRC to prevent it from moving due to rotor wash. The helicopter will then be carefully landed on the CRRC.

NOTE: For proper alignment, the front handle of the CRRC should be next to the main landing gear struts.

18.10.1.2.3.3.2. Attach lines 7, 9, and 11 of the cradle to lines 13, 14, and 15 of the crows feet and tighten with ratchets. Repeat with lines 8, 10, and 12 of the cradle and lines 16, 17, and 18 of the crows feet and tighten with ratchets until no slack remains.

18.10.1.2.3.3.3. Once all six straps are attached to the crows feet, lift the helicopter into a one to two foot hover. The CRRC will hang approximately six inches below the helicopter and self center. Once the boat is centered, it is important for the aircraft to set down directly over the load. A crewmember positioned at each crows foot must tighten one ratchet in synchronization with the opposite side. Once the FE and AG are satisfied that all six ratchets are as tight as possible, the helicopter lifts to another one to two foot hover with FE and AG standing on the ground. Both crewmembers will ensure that the boat is snug against the bottom of the aircraft, with all lines tight and no twists in them. When both crewmembers are satisfied the boat is secure, set the helicopter on the ground. Repeat as necessary until the CRRC is rigged as tightly as possible against the bottom of the aircraft.

18.10.1.2.3.3.4. Insert the free ends of line 20 (bow strap) into the ratchets attached to the small suspension clevises and the crows feet. Ensure the strap is not twisted, then ratchet tightly until the nose of the CRRC is snug against the bottom of the aircraft.

WARNING: Do not route line 20 around the wheels of the helicopter. Ensure that it is routed to the inside of the wheels.

18.10.1.2.3.4. CRRC Deployment:

WARNING: Prolonged out of trim flight may result in the CRRC load becoming unstable and trapping air between the CRRC and the aircraft. This condition may lead to the loss of any equipment carried inside the CRRC resulting in damage to the helicopter.

WARNING: Operation of the aircraft with the main landing gear struts extended beyond normal limits will reduce the crash attenuation capability of the helicopter.

WARNING: Outsized zodiac's from other services/nations may cause the sling to become entangled with the "bumper bar" beneath the right cargo door. If entangled with the aircraft, the zodiac may not deploy properly, causing irreparable damage to the zodiac.

18.10.1.2.3.4.1. Standard timing calls are used. The helicopter is flown to the delivery area and established at a maximum of 10 feet and 10 knots GS.

18.10.1.2.3.4.2. The pilot clears the team to deploy and the team leader cuts the shear strap.

WARNING: Ensure that all team members are clear of the harness straps and floor edges prior to cutting the shear strap.

18.10.1.2.3.4.3. Once the CRRC has been released, the team will exit the helicopter out both sides simultaneously.

WARNING: Jettison testing of the CRRC has not been conducted. Aerodynamic jettison characteristics of the CRRC are unknown. The possibility of catastrophic damage to the helicopter exists when the CRRC is jettisoned.

18.10.1.2.3.5. CRRC Emergency Jettison.

***CAUTION**: Emergency jettison of the CRRC should be a last resort attempt to recover from an emergency situation. If emergency jettison of the CRRC is required, level, in trim flight, at 80 KIAS or less is recommended.

18.10.1.2.3.5.1. Consideration should be given to landing with the CRRC attached or releasing the CRRC on short final at less to 10 knots GS.

18.10.1.2.3.5.2. The CRRC is jettisoned by cutting the shear strap.

18.10.2. Use the following procedures for delivering CRRCs from the H-53:

18.10.2.1. Aircrew and team briefings will emphasize proper hand signals, time calls and emergency procedures.

18.10.2.3. CRRC center of gravity limitations will be discussed during both briefings. Failure to ensure adequate distribution of the team's equipment may result in an aft CG causing the craft to become near vertical during deployment.

18.10.2.4. CRRC and personnel equipment must be securely attached and positioned inside the craft before loading onto the aircraft.

18.10.2.5 Ensure all contents of the CRRC are securely attached and positioned inside the CRRC, otherwise, the CRRC may snag on the aircraft during deployment.

18.10.2.6. Boat/Raft Configuration.

18.10.2.6.1. Remove keel guard if desired. The boat may be laced to plywood or suitable material which will roll easily on the H-53 roller system.

18.10.2.6.2. The boat may be loaded bow or stern first; two boats may be loaded if loaded bow first in the H-53. Secure the boats with at least two cargo tiedown straps per boat, with a short bow or stern line attached to the aircraft.

18.10.2.6.3. The aircrew should attempt to limit the amount of equipment deployed in the boat or raft.

18.10.2.6.4. Brief and use the following procedures:

18.10.2.6.4.1. At the "5-minute" call, team members who will deploy from the front, if this method is used, will move to the front of the cabin area. The team members who will deliver the boat will prepare for exit in the aft.

NOTE: H-53 must have the tail skid retracted prior to drop.

18.10.2.6.4.2. At the "1-minute" call, the team members and crewmembers will prepare the boat for drop by removing tiedown straps except bow or stern line.

18.10.2.6.4.3. The pilot will approach a 10-foot wheel height above the waves while slowing to 10 knots ground speed. The hover coupler may be used. The pilot not flying or FE will call out radar altimeter readings to the pilot.

18.10.2.6.4.4. When cleared to drop, the pilot will say "BOATS, BOATS, BOATS". When cleared, the designated crewmember or team member will release the bow or stern line from the aircraft and push the boat out.

NOTE: The team may exit the aircraft from either the door or ramp or both. If both are used, execute the ramp delivery first. These measures will reduce adverse pitch oscillations during deployment.

18.10.2.6.4.5. The delivery team leader will remain on intercom until the 1-minute call. Designate a prebriefed crewmember on intercom to relay the clear to drop signal to the team. Concise briefings and good crew coordination are a must in conducting safe helo cast operations.

18.11. Seven or Twenty-Man Life Raft.

18.11.1. Preparing the raft for drop.

18.11.1.1. Remove the raft inflation D-ring from its pocket and leave the pocket unsnapped.

18.11.1.2. (MH-53) Securely tie a 14-inch piece of MIL-T-5661-C web tape through the D-ring to form an approximate 5-inch loop. Secure raft in forward section of cabin. Attach a 10-foot lanyard (the one used for flare drops) to the tiedown ring located by the forward most part of the side cargo door. Attach the other end to the 5-inch loop of web tape.

18.11.1.3. Attach the lanyard to a floor tie-down ring.

18.11.1.4. Snap the carrying handles together beneath the raft.

18.11.1.5. Attach chemlights to the raft at night prior to deployment.

18.11.2. Delivery Procedures.

18.11.2.1. Use a smoke device on all life raft drops to assist in determining the exact wind direction and a drop reference (if required).

18.11.2.2. Use normal traffic pattern airspeeds and altitudes.

18.11.2.3. Make a shallow approach in order to establish level flight at 40 knots and 75 feet altitude on final. Two crewmembers work together, one to monitor the survivor and one to signal the other crewmember to deploy the raft when directly over the survivor. Delay the drop 1 second for every 5 knots of wind over 10 knots. After dropping the raft, call "raft away" and immediately recover the lanyard.

18.11.3. Safety Procedures.

18.11.3.1. Recommend use of the radar altimeter.

18.11.3.2. May require two persons to deploy the 20-person raft.

18.11.3.3. A suitable cutting device will be available to cut the raft if it should become entangled.

18.11.3.4. Do not hold the 10-foot lanyard after the raft is dropped.

18.12. Personnel Parachute Delivery. The procedures in this section are provided for those instances where airdrops are required. Personnel delivery operations refer to operations where the unloading of personnel is accomplished from an aircraft in forward flight. Personnel will exit the aircraft on the command of a qualified jumpmaster after clearance is received from the aircraft commander. Reference FM 57-220, T.O. 14D1-2-2, FM 57-230, FM 31-19, AND USSOCOM Manual 350-2.

18.12.1. Mission Briefing. The aircraft commander and jumpmaster will conduct a thorough briefing. All aircrew members and the jumpmaster will attend. Ensure a passenger briefing is given. In addition, cover the following items:

18.12.1.1. Use of restraining devices.

18.12.1.2. Use of doors and ramps.

18.12.1.3. Movement in the cargo compartment.

18.12.1.4. Hung jumper procedures.

18.12.2. Personnel Parachute Drop Zone Markings. The jumpmaster or drop zone controller will brief placement and type markings for both day and night drops. The DZ controllers and the aircrews will fully coordinate on type markings used, method of identification, authentication, and release point.

18.12.3. DZ Identification and Authentication. The jumpmaster or DZ controller will brief the DZ markings and authentication procedures. They will also cover communication and communication out procedures for the drop, to include ground-to-air signals if any.

18.12.4. Personnel Parachute Delivery Deployment Abort Procedures. When conditions are not safe for the drop or if the drop is aborted for any reason, the following procedures apply. Any crewmember will notify the other crew members by interphone using the words "NO DROP." The call will be acknowledged and the jumpmaster will be notified immediately if not on intercom. Once the situation is resolved the drops can continue.

18.12.5. Wind Limitations for Personnel Parachute Delivery. Wind limits are determined by regulations, type of parachute used, water or land deployment, and type of terrain. The jumpmaster will prebrief wind limits to the aircraft commander.

18.12.6. Altitude and Airspeed Limitations for Personnel Parachute Delivery (Training).

18.12.6.1. Minimum pattern altitude. 1500 AGL/MSL. (1000 ft for SOF when required for contingency training.)

18.12.6.2. Delivery Airspeed. 60-90 KIAS. (Specific airspeed must be briefed prior to takeoff.)

NOTE: Do not hook up static lines until the aircraft is 1000 ft AGL. Military free fall jumpers will not unfasten seat belts or restraint harnesses until above 1000 ft AGL.

18.12.7. Personnel Parachute Delivery Positions On-Board the aircraft.

18.12.7.1. MH-60. Sitting on the floor at edge of cargo doors. From either or both sides (if only one side is used it should be the side opposite the tail rotor). Exception: Military free fall jumpers can exit from a standing position.

18.12.7.2. MH-53. Standing on the ramp.

18.12.8. Aircraft Restrictions.

18.12.8.1. MH-60 cabin door on tail rotor side should remain closed unless delivering parachutists from both sides.

18.12.8.2. MH-53 tail skid must be retracted.

18.12.9. Aircraft Preparation.

18.12.9.1. The jumpmaster will configure the aircraft as required by regulation and unit operating procedures. (See Figure 18.5 and 18.7 for typical static line hookups.)

18.12.9.2. During preflight the aircrew will ensure the following actions are accomplished:

18.12.9.2.1. All protruding objects and sharp edges in the vicinity of the exits are removed or taped.

18.12.9.2.2. Intercom system (ICS) should be provided for the jumpmaster if possible.

18.12.9.2.3. A restraint harness is provided for the jumpmaster.

18.12.10. Communications.

18.12.10.1. Air-to-Surface. Radio contact with the DZ is normally required. This requirement is waived if:

18.12.10.1.1. Lost communication procedures are prebriefed.

18.12.10.1.2. Marker Panels and DZ markers are visible to the pilot or jumpmaster when inbound to the DZ.

18.12.10.2. Communication Procedures and Voice terminology. The accuracy of a personnel delivery mission depends on the coordination between crewmembers and the jumpmaster. The pilot will normally give 10-minute, 5-minute, and 1-minute warnings prior to reaching the drop zone. The pilot will give the "clear to drop" at the 1-minute call. The decision whether or not to deploy jumpers rests with the aircraft commander. The jumpmaster will acknowledge all calls from the pilot (while on intercom). The jumpmaster provides heading corrections on final approach using the following standard terminology:

18.12.10.2.1. "Steady." Present course is satisfactory.

18.12.10.2.2. "Right." Change direction to the right 5 degrees.

18.12.10.2.3. "Left." Change direction to the left 5 degrees.

18.12.10.2.4. "Right (or left) ____ degrees." This is utilized to direct changes in excess of 5 degrees.

18.12.10.2.5. "No Drop." Make no drop due to unsafe or unknown conditions or unsatisfactory positioning over target.

18.12.10.2.6. "Jumpers Away, Clear to Turn." The pilot is clear to turn and begin the next pass or observe the results of the drop just accomplished. The safety man retrieves all deployment bags prior to issuing clearance to turn.

18.12.10.2.7. Special Considerations. To inform the pilot of the location of the spotter chute, streamer or jumper, use clock positions relative to the last heading flown: i.e., the spotter chute landed at the 12 o'clock position, 100 yards away, etc.

18.12.10.3. Hand signals. When off intercom, the jumpmaster will use the following hand signals to relay course corrections through the safety man (prebrief them prior to flight).

18.12.10.3.1. Thumb - left/right indicates 5 degree corrections.

18.12.10.3.2. Straight ahead is indicated by a "slicing motion" parallel to the longitudinal axis of the aircraft, hand held perpendicular to the floor.

18.12.10.3.3. Abort jump or lost target is indicated by clenching the fist and placing it in front of the jumpmaster for an aborted jump.

18.12.11. Personnel Parachute Delivery Emergency Procedures. The jumpmaster will prebrief towed parachutist actions at the aircrew briefing.

18.13. Land Equipment Drops. The approach should be planned so that delivery of equipment can be accomplished at the lowest airspeed and altitude that will allow safe flight. Caution must be exercised to preclude injury to personnel on the ground during the delivery. Drops will always be made to targets set up by ground personnel. Accomplish aerial delivery of equipment in the following manner:

18.13.1. Ground forces personnel are responsible for selecting the DZ and marking the desired point of impact with panels, smoke, or lights. The pilot is responsible for selecting the release point and initiating the airdrop so that the cargo impacts as closely as possible to the designated impact point (target).

18.13.2. Free drops should be made at as low an altitude as safety permits, but never above 200 feet AGL.

18.14. Vehicles, Motorcycles, and ATV's (MH-53).

18.14.1. Vehicles.

18.14.1.1. When transporting heavy vehicles it may be necessary to utilize the 20,000 pound tiedown rings and 10,000 pound tiedown straps. The T.O. 1H-53(H)B-9 should always be referred to when loading any vehicle. With the ramp down, back the vehicle into the helicopter using the left and tail scanners as guides or spotters. Get the vehicle as far forward and as close to the avionics rack as possible. Secure the vehicle with a minimum of four 5,000-pound tiedown straps. The straps attach to the vehicle tiedown rings and to the 10,000-pound tiedown rings along the cabin wall. At the 1-minute call the team may get into the vehicle and start the engine. After landing, the left and tail scanners will remove the straps from the vehicle. The tail scanner will ensure the ramp is down and the area is clear for deployment of the vehicle, step out of the way, and clear the team or vehicle out of the helicopter.

18.14.1.2. Prior to exfil, the crew should put small chemlights along the left side overhead litter brackets for the driver to use as a guide. The left and tail scanner will act as guides during loading. Secure the vehicle prior to takeoff.

18.14.2. Motorcycles.

18.14.2.1. Depending on the room available, motorcycles should be secured along the side of the cabin wall. Utilize a 10,000-pound tiedown ring, a 5,000-pound tiedown ring, and a 5,000-pound tiedown strap. Ensure all movement (forward, aft, left, right, and vertical) is restrained. At the 1-minute call the team members may start the motorcycle engine and be ready to release the tiedown straps. Once on the ground the tail scanner ensures the ramp is down and the area is clear for deployment, he will then clear the team to go. The team member will release and remove the tiedown strap and depart the helicopter.

18.14.2.2. On exfil, lower the ramp. The left and tail scanner will marshall the motorcycles on to the helicopter. The motorcycles will move as far forward as possible and then be secured prior to takeoff.

18.14.3. All Terrain Vehicle (ATV).

18.14.3.1. The average measurements of the ATV is, length 89 inches, width 41 inches, and height 60 inches. Place the ATV as far forward and as close to the avionics rack as possible. According to the measurements you should be able to put two ATVs side by side with a total of six in the cabin (possibly seven with one in the center of the cabin next to the avionics rack). Secure the ATVs with two 5,000-pound tiedown straps in an X configuration to at least a 5,000-pound tiedown ring. At the 1-minute call the team members may start the ATVs. When on the ground the straps are removed, the tail scanner will ensure the ramp is down and the area is clear for deployment, and clear the ATVs off the helicopter.

18.14.3.2. On exfil, lower the ramp. The left and tail scanners will marshall the ATVs on to the helicopter. The ATVs will move as far forward as possible and then be secured prior to takeoff.

***Figure 18.1. Water operations/hoist pattern (Side View).**

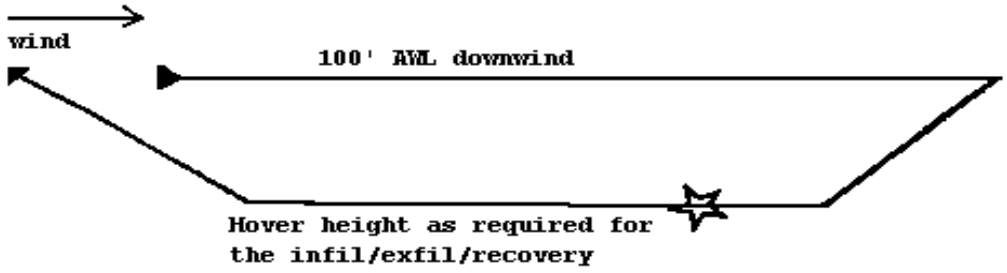
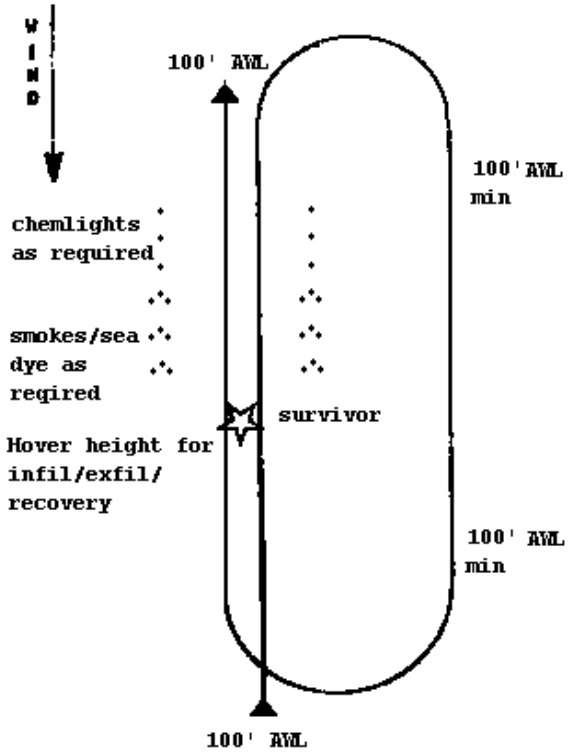


***Figure 18.2. Water operations/hoist pattern (Top View).**



Note 1. For subsequent patterns, obtain 50 KIAS/50 feet AWL minimum prior to turning downwind if OGE power is not available. With OGE power, start the turn at a minimum of translational lift airspeed and 50 feet AWL.

Note 2. Hover height is determined by the type of infil/exfil/recovery operation. The maximum height and speed for a low and slow is 10' AWL and 10 knots ground speed. All other operations are based on the type of device used and METT-T considerations.

Note 3. The water operations pattern can be adjusted based on METT-T considerations, but altitude and airspeed/groundspeed restrictions remain in effect at all times.

Figure 18.3. H-60 Rope Ladder Attaching Points.

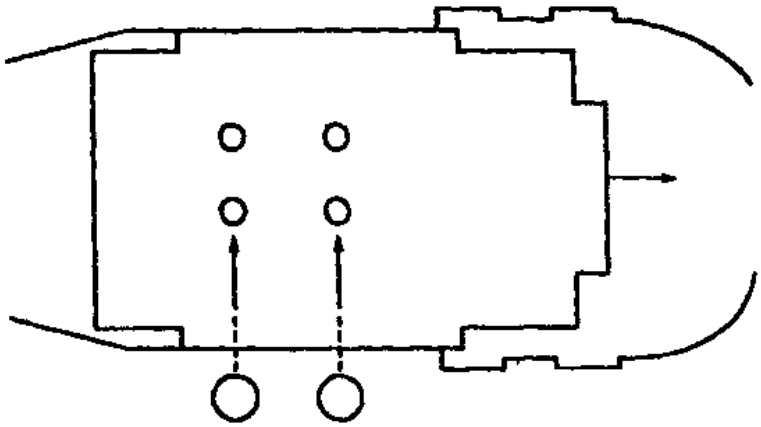


Figure 18.4. H-53 Rope Ladder Attaching Points.

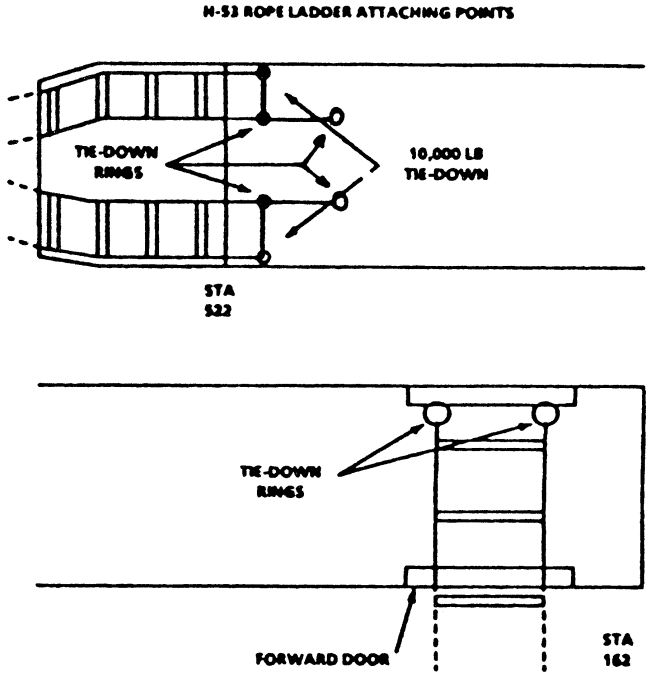


Figure 18.5. H-60 Anchor Line Cable (Typical).

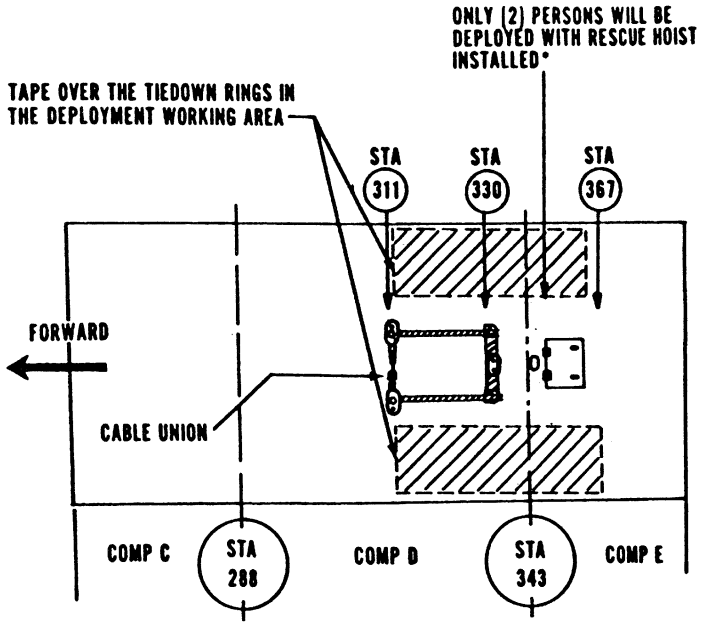


***Figure 18.6. H-53 Rappel anchors**

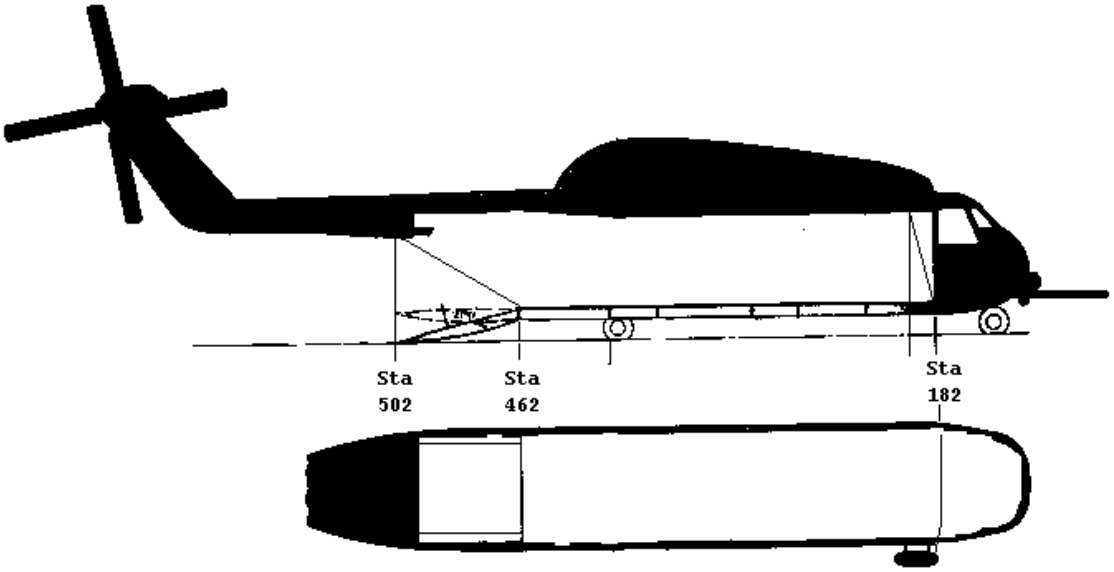


Figure 18.7. H-53 Anchor line cable

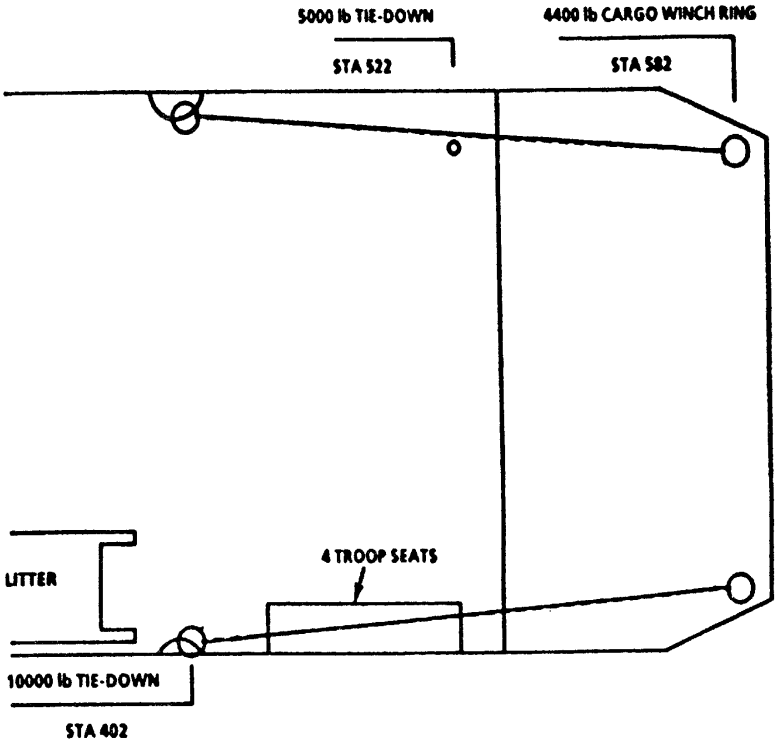


Figure 18.8. H-60 Rappel Anchors

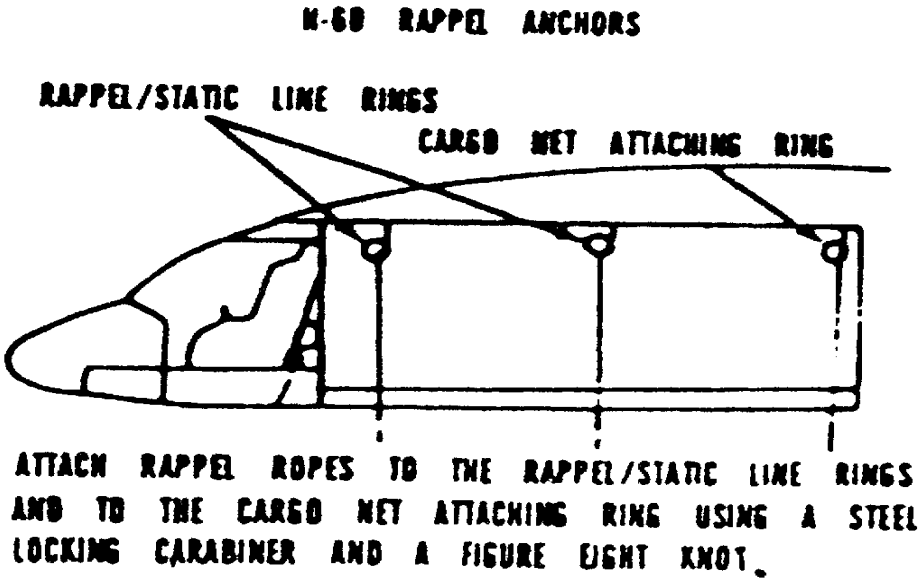
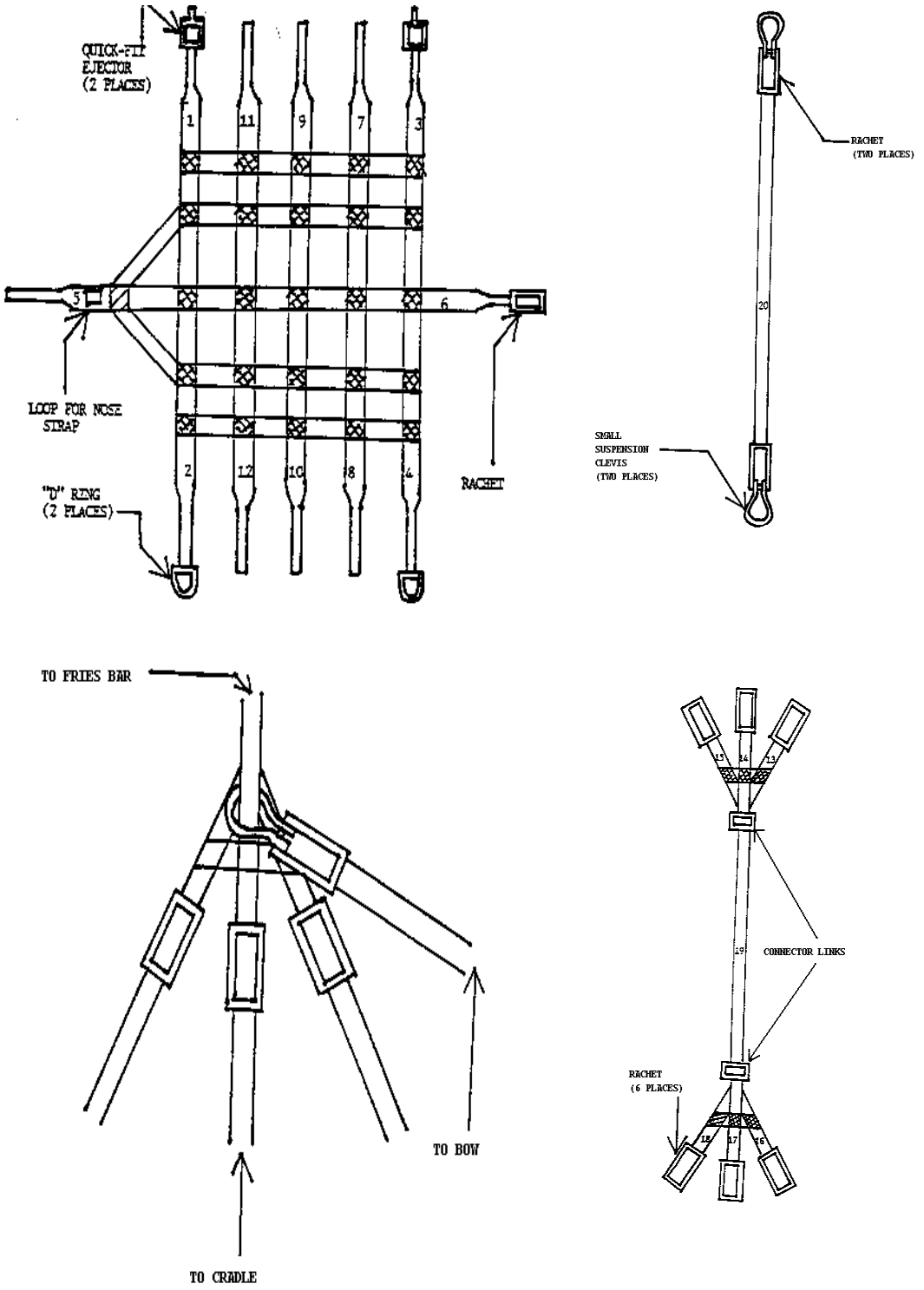


***Figure 18.9. H-60 K-duck attaching straps**



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19.6.3.2.1. Target is covered from only one direction at a time.

19.6.3.2.2. Enemy is able to place enfilade fire on the entire attack formation from one position.

19.6.3.2.3. Direction of break is fixed.

*19.6.4. "L" Attack Pattern (Figure 19.2.). The "L" attack is simply a single pass against a target. It minimizes the aircraft's exposure time to enemy fire and is easily adapted to any terrain. The pattern can be used with any number of aircraft. The firing leg should be flown to allow side fire weapons to fire in the forward azimuth with the tail gun engaging after the break. The threat and terrain will determine the time from bingo to break. The break angle is determined by flight lead based on METT-T considerations. Spacing is set by wing aircraft based on the number of aircraft in the formation. Spacing should be far enough apart to keep the enemy from targeting two aircraft at once while maintaining continuous fire on the target. The "L" attack can be used as an entry for other attack patterns and lends itself to respond quickly to a "repeat" call from the ground team.

*19.6.4.1. Advantages.

*19.6.4.1.1. Pattern is easily adapted to any situation.

*19.6.4.1.2. Can be used with any number of aircraft.

*19.6.4.1.3. Permits the delivery of a large volume of fire in a short period of time.

*19.6.4.2. Disadvantages.

*19.6.4.2.1. Difficult to acquire the team and the target, assess the situation, and provide effective fire with one pass.

*19.6.4.2.2. Corrections to fire by the ground team are difficult to react to on a single pass.

*19.6.4.2.3. Target is only covered from one direction.

*19.6.4.2.4. Does not provide continuous fire on the target.

19.6.5. Dogbone Pattern (Figure 19.3.). An effective pattern designed to place protective fire between the team on the move and a pursuing hostile force.

19.6.5.1 Advantages.

19.6.5.1.1. Attacking helicopters are mutually supporting and control is easily maintained during the attack.

19.6.5.1.2. The pattern may be modified to adapt to terrain and number of firing passes required.

19.6.5.1.3. Length of time for firing pass is quite long.

19.6.5.1.4. Maneuvering places helicopters in position to cover teams without firing into friendly positions.

19.6.5.1.5. Entry may be from any position using combination of mixed ordinance (Figure 19-4).

NOTE: The loops of the basic dogbone should always be made away from the target position.

*19.6.6. Random/Modified (Figure 19.5.). This pattern gives the helicopter capability of delivering side fire, and may be entered from either the "L" attack or the dogbone.

19.6.7. Spooky Pattern (Figure 19.6.). This pattern is basically the same as a circling pattern but flown at an altitude above the range of enemy ground fire. It can be used effectively to provide a ring of fire around a friendly position that may be completely surrounded. Firing can be done on a tangent to the friendly position which will prevent ricochets or direct fire from hitting the friendlies. This pattern is useful in providing an escape route for a team or neutralizing a maneuvering area for a low altitude pattern.

19.7. Armed Helicopter Escort. No matter what circumstances are encountered during the escort role, the duties of the armed helicopters remain the same. Before the extract helicopter (slick) descends into the area, the armed escort ships should make a thorough reconnaissance of the flight route, radio instructions to the slick, and get into position to escort the slicks into the area.

19.7.1. During the approach portion of an escort, the armed helicopters must be in position to provide fire support, as necessary.

19.7.2. When the friendly troops are engaged in a firefight with the enemy, another procedure must be used. In this situation, enemy units can often be accurately located. Once the enemy has been located, a route should be selected which offers the best protection in terms of concealment and avoidance of enemy ground fire.

19.7.3. A suppressive attack on the enemy position will allow the slick aircraft to make its approach with comparative safety. The attack must be timed to place heavy continuous fire on the enemy positions during the final portion of the slick's approach. Fire support must be delivered also while the slick is on the ground or in a hover. While on the ground or in a hover and exfilling a team, (if the team is behind the aircraft), the slick may fire when escort aircraft are not engaging the hostile forces or are off target.

19.7.4. If the armed escort helicopters have made a thorough reconnaissance of the route and landing area, there should be little difficulty in escorting the slick from the area. Try to avoid establishing a definite departure pattern. Choose a departure route that offers concealment and avoids all known enemy areas. The slick should notify the escorts of its intentions prior to departure. This will allow the armed escorts time to maneuver into proper position to give maximum protection during the departure.

19.8. Aircrew Responsibilities.

19.8.1. To be effective, the crew must be well briefed on the mission. They must know the enemy situation, the friendly situation, the formation to be flown, and the specific mission of the helicopter. The pilot's briefing should include applicable ROE and any local operating procedures.

19.8.2. Give the gunner an opportunity to test fire the weapon prior to any potential engagement. This can be accomplished over open fields or bodies of water, carefully avoiding inhabited areas. When in formation, prior to test fire, the pilot will request clearance from the flight leader.

NOTE: For training purposes, only fire weapons on an approved range, warning area, or restricted area.

19.8.3. Under normal circumstances, the gunner will not leave his assigned position within the aircraft until cleared to do so.

19.8.4. Gunners should keep brass policed from the cabin area. Not only does this brass cause precarious footing, but it can work its way beneath the floor panels and jam controls. On training missions, police the brass prior to departing the range.

19.8.5. When engaging targets or flying cover for the slick, the gunner should immediately notify the pilot of gun malfunctions. The gunner should assist the pilot in maintaining relative position during the gun patterns by giving clear, concise information pertaining to the location of the LZ and other aircraft in the pattern.

***Figure 19.1. Racetrack Pattern.**

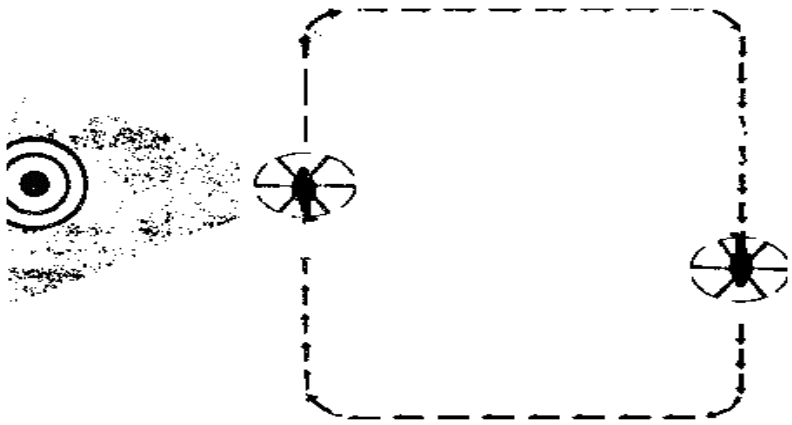

***Figure 19.2. "L" Attack Pattern.**